FEBRUARY 12, 1955 PAGES 315 TO 362

THE LANCET

Telegrams: LANCET, RAND, LONDON Telephone: TEMPLE BAR 7228 and 7229

No. VII OF VOL. I, 1955
No. 6859 VOL. CCLXVIII

LONDON, SATURDAY, FEBRUARY 12, 1955
Founded 1823 PUBLISHED WEEKLY Registered as a Newspaper

Pp. 104—Price 1s.
Annual Subscription: £2 2s.

Phenobarbitone therapy without 'hangover' effects

'SCORBITAL'
TRADE MARK

Tablets containing
Phenobarbitone (16 mg.) gr.¼ Ascorbic acid 100 mg.

"Ascorbic acid, 200 mg. at night or on waking has been found valuable in combating the hangover effects of barbiturates."
(PROC. ROY. SOC. MED., 1954 (MAR.), 47, 215)

BASIC N.H.S. PRICES:
Bottle of 50—3/6 250—13/-

THE BRITISH DRUG HOUSES LTD. (Medical Department) LONDON N.I

OXFORD MEDICAL PUBLICATIONS
SEE PAGE 2

Now in its Second Edition.
VARICOSE VEINS
By R. ROWDEN FOOTE
Price 55s. net
"... a book to be recommended with enthusiasm."
—*The Practitioner.*
Butterworths, 88, Kingsway, London, W.C.2

MANAGEMENT OF BURNS
Six articles prepared by a subcommittee of the BRITISH ASSOCIATION OF PLASTIC SURGEONS
Reprinted from THE LANCET *with an appendix*
These articles record the practice of surgeons who are treating burns every day and who see the good results of treatment that is carefully planned from the start. Here is their plan, fully but briefly set out.
48 pages Price 2s. 6d. (postage 4d.)
The Lancet Limited, 7, Adam-street, Adelphi, London, W.C.2

CAREERS IN MEDICINE
Edited by P. O. WILLIAMS, M.A. (Cantab.), M.B., B.Chir., M.R.C.P.
With contributions from 49 eminent medical authorities
Cr. 8vo 292 pages Price 15s. net, plus 8d. postage
This book outlines the particular qualities of mind, the type and amount of specialised training, required in each branch of the Medical Profession.
"... it should be in the hands of everyone who has to advise medical students, and certainly should be consulted by every newly-qualified doctor."—*The Practitioner.*
Hodder & Stoughton Ltd., 20, Warwick-square, London, E.C.4

Third Edition *In the press*
ABDOMINAL OPERATIONS
By RODNEY MAINGOT, F.R.C.S.
Surgeon, Royal Free Hospital
Over 1600 pp. More than 11 new chapters and over 400 new illustrations. Price £8 10s. net
H. K. Lewis & Co. Ltd., 136, Gower-street, W.C.1

Second Edition
SURGERY: A TEXTBOOK FOR STUDENTS
By CHARLES AUBREY PANNETT, B.Sc., M.D., F.R.C.S.
Professor of Surgery, University of London; Director of the Surgical Unit, St. Mary's Hospital, London; sometime member of the Court of Examiners, R.C.S. Eng., and Examiner to the Universities of London, Manchester, and Cardiff.
769 + xiv Price 27s. 6d. net, plus 1s. postage
Extensively illustrated throughout text
The book has been completely revised to incorporate advances in surgery since the issue of the first edition. At the same time unnecessary matter has been avoided, so that the book remains a presentation of modern surgery of moderate size. The character of the book has been preserved but the additional matter makes it more generally useful to postgraduate as well as undergraduate students
Hodder & Stoughton Ltd., 20, Warwick-square, London, E.C.4

DISABILITIES
AND HOW TO LIVE WITH THEM
by 55 Patients
Demy 8vo 252 pages Price 10s. 6d. net, plus 6d. postage
"This is a book which increases understanding; it should be immensely valuable to the medical and social work professions, and by everyone it could be read with advantage."
—Review in *Mental Health.*
The Lancet Limited, 7, Adam-street, Adelphi, London, W.C.2

NEW THIS MONTH

ESSENTIALS OF ORTHOPAEDICS
By PHILIP WILES, M.S., F.R.C.S., F.A.C.S.
Senior Orthopædic Surgeon, The Middlesex Hospital, London, and Lecturer in Orthopædic Surgery, University of London.
Second Edition. 7 Coloured Plates and 393 Text-figures. 55s.

DISEASES OF THE LIVER
By MITCHELL A. SPELLBERG, M.D., F.A.C.P., University of Illinois. 96 Illustrations (2 in Colour). 120s.

ANTENATAL AND POSTNATAL CARE
By F. J. BROWNE, M.D., D.Sc., F.R.C.S.Ed., F.R.C.O.G., and J. C. McCLURE BROWNE, M.B., B.S., F.R.C.S.Ed., F.R.C.O.G. *Eighth Edition.* 94 Illustrations. 37s. 6d.

CLINICAL ASPECTS OF THE AUTONOMIC NERVOUS SYSTEM
By L. A. GILLILAN, Ph.D., M.D., University of Pennsylvania. 42 Illustrations. 45s.

J. & A. CHURCHILL LTD., 104 GLOUCESTER PLACE, LONDON, W.1

New

IRON BY INTRAMUSCULAR INJECTION

BENGER LABORATORIES, who introduced the first intravenous iron preparation, now present a new and equally effective iron complex for intramuscular administration. ITS NAME IS IMFERON. The introduction of this new compound considerably simplifies the control of iron deficiency anaemias in both hospital and general practice.

Note these advantages . . .

★ **Imferon** is the first effective preparation of iron to be suitable for intramuscular administration.

★ **Imferon** provides the rapid, reliable response of an order hitherto only obtainable with intravenous preparations; and it is much less time-consuming to administer.

★ **Imferon** is particularly indicated for the patient who is refractory to, or intolerant of oral iron; and when a rapid response is required, as in anaemia of pregnancy.

★ **Imferon** provides the equivalent of 50 mg. of iron in each millilitre.

AMPOULES 2 ml. (100 mg. Fe.) boxes 10 and 100; AMPOULES 5 ml. (250 mg. Fe.) boxes 5 and 50

Fully-descriptive literature on request. A Technical Information Service is at your disposal.

Imferon TRADE MARK

Iron-Dextran Complex

A PRODUCT OF BENGER RESEARCH

BENGER LABORATORIES LIMITED · HOLMES CHAPEL · CHESHIRE

1.4

FEB. 12, 1955 PAGES 315 TO 362

THE LANCET

A JOURNAL OF BRITISH AND FOREIGN MEDICINE, SURGERY, OBSTETRICS, PHYSIOLOGY, PATHOLOGY, PHARMACOLOGY, PUBLIC HEALTH, AND NEWS

No. 6859 LONDON: SATURDAY, FEBRUARY 12, 1955 CCLXVIII

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ORIGINAL ARTICLES

B.C.G. Vaccination
Prof. F. R. G. HEAF, F.R.C.P. 315
Urinary Excretion of Œstrogens During the Menstrual Cycle
J. B. BROWN, PH.D. 320
Effective Circulation of the Uterine Wall in Late Pregnancy
NORMAN MORRIS, M.R.C.O.G.
S. B. OSBORN, B.SC.
H. PAYLING WRIGHT, L.M.S.S.A. 323
Action of Breathing Exercises in Pulmonary Emphysema
E. J. M. CAMPBELL, M.R.C.P.
JOHN FRIEND, M.R.C.P. 325
Tetany Complicating the Treatment of Potassium Deficiency in Renal Acidosis
PAUL FOURMAN, M.R.C.P.
Prof. R. A. MCCANCE, F.R.C.P., F.R.S. 329
Malignant Argentaffinoma
J. S. JENKINS, M.R.C.P.
P. J. A. BUTCHER, M.B. 331
Spontaneous Hypoglycæmia due to Islet-cell Tumour of the Pancreas
T. A. GRIMSON, M.R.C.P.
JOAN YELL, M.B. 334

PRELIMINARY COMMUNICATION

Excretion of Ethanolamine-phosphoric Acid in Cœliac Disease
O. D. FISHER, M.R.C.P.
D. W. NEILL, M.SC. 334

NEW INVENTIONS

A Modified Morson Bladder Retractor
MAURICE LEE, F.R.C.S. 335

SOCIAL AND BIOLOGICAL FACTORS IN INFANT MORTALITY

I. Objects and Methods
J. N. MORRIS, M.B.C.P.
J. A. HEADY, M.A. 343

REVIEWS

Notices of Books 335

LEADING ARTICLES

PHARMACOLOGY OF CHLORPROMAZINE 337
NUTRITIONAL CIRRHOSIS 337
SPLENIC CIRCULATION 338

ANNOTATIONS

Urinary Excretion of Œstrogens 339
Lungs, Bones, and Joints 340
Carriage of Tuberculous Patients by Air 341
Hyperparathyroidism and Peptic Ulcer 341
Chemotherapy and Surgery in Pulmonary Tuberculosis 342
New Analgesic 342

MEDICINE AND THE LAW

Negligence Appeal Fails 349

IN ENGLAND NOW

A Running Commentary by Peripatetic Correspondents 352

LETTERS TO THE EDITOR

The Hospital Staff (Dr. M. Lubran) 353
Institution and Service 353
Perforated Peptic Ulcers (Mr. H. D. Moore, F.R.C.S.) 353
Chlorpromazine and Gastroscopy (Dr. A. H. Douthwaite) 354
Hardened Fats and Lung Cancer (Mr. A. E. Bender, PH.D.) 354
Tuberculosis in Immigrants (Dr. Evelyn Hess, Dr. Norman Macdonald) 354
Vicarious Appetite (Dr. John Penman; Dr. Donald McGregor) 355
Venereology and Dermatology (Mr. Ambrose King, F.R.C.S., Dr. Brian Russell) 355
Manipulation and Cervical Spondylitis (Mr. T. T. Stamm, F.R.C.S.) 355
Influenza (Dr. John Fry) 356
Total Gastrectomy (Mr. J. E. Richardson, F.R.C.S., Dr. Denys Jennings) 356
Children's Hospital to be Converted? (Dr. J. W. Wells; Dr. H. H. MacWilliam; Dr. J. G. Howells; Dr. C. H. Neville-Smith) 357
Impotence (Dr. B. Sandler) 358
Geography of General Practices (Dr. S. J. Hadfield) 358
Isobel Cripps Centre 358

PARLIAMENT

Clean Air Bill 350
Social Services in the Colonies 350
Question Time 350

PUBLIC HEALTH

Typhoid in Yorkshire 351
Smallpox in France 351
Local Population Estimates for 1954 351
Infectious Diseases in England and Wales 351

OBITUARY

Albert Ernest Hamerton 359
Robert Lister Horton 359
Grace Mary Lukose 359
Sir Edward Mellanby 359
Prof. James Whillis 360

NOTES AND NEWS

World Health Organisation 361
Interlingua 361
A New Children's Ward 361
New Rules for Midwives 362
Laboratory Service in Emergencies 362
Royal College of Physicians of Edinburgh 362
Chadwick Lecture 362
London County Council 362
Basingstoke Plastic Centre Medical Society 362
St. Mark's Hospital, London 362
Diary of the Week 362
Appointments 360
Births, Marriages, and Deaths 360

Ready this month:

STUDIES ON FERTILITY—VI

Edited by R. G. HARRISON

The **Proceedings of the Society for the Study of Fertility** have in the past been published annually in journal form (available at 10s. each). Material of such importance, however, was felt to be worthy of more permanent record, and in future the Society will present as a complete book a selection of the papers read at the annual Conference together with other papers of high standing. This policy will be widely welcomed by all those whose work involves the study of fertility. A detailed prospectus of this volume and earlier issues is available.

175 pages 50 illustrations 21s. net

BLACKWELL SCIENTIFIC PUBLICATIONS · OXFORD

OXFORD MEDICAL

PUBLICATIONS

DISEASES OF INFANCY AND CHILDHOOD

by FIFTY-EIGHT CONTRIBUTORS

Edited by the late Sir LEONARD PARSONS, *F.R.S.*

and SEYMOUR BARLING, *C.M.G., M.S., M.Ch., F.R.C.S.*

Assisted by CLIFFORD G. PARSONS, *M.D., F.R.C.P.*

'The approach is essentially clinical, and within these two volumes the pædiatrician and the general practitioner will find an authoritative guide to current practice.'—THE PRACTITIONER

SECOND EDITION 2116 *pages* 342 *illustrations* *In two volumes, The Set* **£8 8s.** *net*

THE ANATOMY OF THE BRONCHIAL TREE

by Sir RUSSELL BROCK, *M.S., F.R.C.S., F.A.C.S.*

'It is superfluous to comment on the importance of this treatise, which has long been acknowledged. It is, however, pertinent to commend the author's simple and readable presentation, which makes his book a pleasure to study.'—POSTGRADUATE MEDICAL JOURNAL

SECOND EDITION 250 *pages* 286 *illustrations* (19 *in colour*) **45s.** *net*

Selected illustrations suitable for use as a wall chart are available, price **5s.** net per packet of 9 plates.

A PRACTICAL MANUAL OF DISEASES OF THE CHEST

by MAURICE DAVIDSON, *D.M., F.R.C.P.*

'Not without reason described as the most complete survey of the clinical and pathological aspects of chest diseases in the language.'—THE MEDICAL OFFICER

FOURTH EDITION 658 *pages* 261 *illustrations* **84s.** *net*

PULMONARY TUBERCULOSIS

PATHOLOGY, DIAGNOSIS, MANAGEMENT AND PREVENTION

by WALTER PAGEL, *M.D.*

F. A. H. SIMMONDS, *M.D., D.P.H.*

and NORMAN MACDONALD, *M.B., M.R.C.P.(Ed.)*

'Lucidly written, beautifully illustrated with a profusion of post-operative and autopsy specimens of lungs in various stages of disease.'—THE BRITISH JOURNAL OF TUBERCULOSIS AND DISEASES OF THE CHEST

THIRD EDITION 742 *pages* 317 *illustrations* **84s.** *net*

OXFORD UNIVERSITY PRESS

H. K. LEWIS'S PUBLICATIONS

Ready this month Second Edition. With Illustrations. 10 in. × 7¼ in. **£5 10s. 0d.** net.

PRINCIPLES OF INTERNAL MEDICINE

Edited by **T. R. HARRISON,** B.A., M.D., C.M., Professor and Chairman, Emory University School of Medicine; **W. H. RESNIK,** Ph.B., M.D.; **G. W. THORN,** M.D., M.A. (Hon.); and **M. M. WINTROBE,** B.A., B.S., M.D.

Ready this month. Second Edition. With Illustrations. 8½ in. × 5½ in. **£1 7s. 6d.** net; postage 1s. 3d.

TEXTBOOK OF MEDICINE FOR NURSES

By **J. W. JOULE,** M.D., M.R.C.P., Physician to Kingston Hospital.

Eighth Edition. With 543 Illustrations (66 Coloured). 8½ in. × 5½ in. **£1 5s. 0d.** net; postage 1s. 3d.

SURGERY FOR NURSES

By **HAMILTON BAILEY,** F.R.C.S., F.I.C.S., Emeritus Surgeon, Royal Northern Hospital, London, and **R. J. McNEILL LOVE,** M.S. Lond., F.R.C.S., F.I.C.S., Surgeon, Royal Northern Hospital.

THE PRINCIPLES AND PRACTICE OF RECTAL SURGERY

By **W. B. GABRIEL,** M.S. Lond., F.R.C.S. Eng. Fourth Edition. With Coloured Plates and other Illustrations. 9½ in. × 6½ in. **£2 5s. 0d.** net.

TESTS FOR COLOUR-BLINDNESS

By **SHINOBU ISHIHARA,** M.D. Tenth Edition, revised and enlarged. With 38 Plates with instructions and key. **£3 15s. 0d.** net.

THE ANATOMY OF THE EYE AND ORBIT. Including the central connections, development, and comparative anatomy of the visual apparatus.

By **EUGENE WOLFF,** M.B., B.S. Lond., F.R.C.S. Eng. Fourth Edition. With 406 Illustrations (52 Coloured) in Plates and the Text. 10 in. × 7½ in. **£3 3s. 0d.** net.

By the same Author

A PATHOLOGY OF THE EYE

Third Edition. With 318 Illustrations. 10 in. × 7½ in. **£215s. 0d.** net.

Recently Published. Tenth Edition. With 165 Illustrations. 8½ in. × 5½ in. **£1 16s. 0d.** net; postage 1s. 3d.

THE CLINICAL EXAMINATION OF THE NERVOUS SYSTEM

By **G. H. MONRAD-KROHN,** M.D. Oslo., F.R.C.P. Lond., M.R.C.S. Eng., Professor of Medicine in the Royal Frederick University, Oslo, etc.

Fourth Edition. With 195 Illustrations, including 3 Coloured Plates. 10 in. × 7½ in. **£3 3s. 0d.** net.

LYLE AND JACKSON'S PRACTICAL ORTHOPTICS IN THE TREATMENT OF SQUINT AND OTHER ANOMALIES OF BINOCULAR VISION

Revised by **T. KEITH LYLE,** *C.B.E.*, M.A., M.D., M.Chir. Cantab., M.R.C.P. Lond., F.R.C.S. Eng., Surgeon and Medical Officer in Charge of the Orthoptic Dept., Westminster Branch of the Moorfields, Westminster and Central Eye Hospital, etc., assisted by **MARIANNE WALKER,** D.B.O.(T.), Certified Orthoptic Technician (U.S.A.), Orthoptist, St. Luke's Hospital Guildford.

COMMON SKIN DISEASES

By **A. C. ROXBURGH,** M.D., F.R.C.P., late Emeritus Physician for Diseases of the Skin, and Lecturer on Diseases of the Skin, St. Bartholomew's Hospital. Ninth Edition. With 8 Coloured Plates and 215 Illustrations in the Text. 8½ in. × 5½ in. **£1 8s. 0d.** net; postage 1s. 3d.

SPANISH-ENGLISH MEDICAL DICTIONARY

By **MAURICE McELLIGOTT,** F.R.C.S.I. 6½ in. × 4¼ in. **12s. 6d.** net; postage 5d.

ENGLISH-FRENCH, FRENCH-ENGLISH DICTIONARY of the terms used in all branches of Medicine and Allied Sciences

By **P. LEPINE,** Director of the Pasteur Institute. With Coloured Plates and Tables. 8½ in. × 5½ in. **£3 3s. 0d.** net.

FOOD HYGIENE

By **W. CLUNIE HARVEY,** M.D., D.P.H., F.R.San.I., and **HARRY HILL,** F.R.San.I., A.M.I.S.E., F.S.I.A. 9¾ in. × 6¼ in. **£1 15s. 0d.** net; postage 1s. 3d.

GERMAN-ENGLISH MEDICAL DICTIONARY

By the late **F. S. SCHOENEWALD,** M.D. Berlin. 10 in. × 7½ in. **£1 7s. 6d.** net; postage 8d.

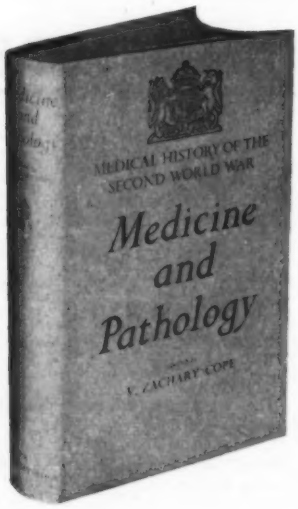
By the same Author

ENGLISH-GERMAN MEDICAL DICTIONARY

10 in. × 7½ in. **£1 5s. 0d.** net; postage 8d.

London: H. K. LEWIS & Co. Ltd., 136 Gower Street, W.C.1

Telegrams: "Publicavit, Westcent, London" **Telephone: EUSton 4282 (7 lines)**



Some Press comments:

Surgery

"A volume which every surgeon will be proud to possess."
The British Journal of Surgery, March 1954

"This is more than a history. It is an effort to review and assess the lessons learned from the surgical experience of the late war and to make them available to the peace-time surgeon."
The American Journal of the Medical Sciences

Medicine and Pathology

"This volume will take its place as the reference work on War Medicine." *The Medical Press*

"This volume makes a great addition to our knowledge of medicine and is a post-graduate course in itself."
The Canadian Medical Journal

The Medical History of the Second World War

Compiled under the direction of an Inter-Services Editorial Board, Editor-in-Chief Sir Arthur S. MacNalty, K.C.B., this work, nine volumes of which have already been published, forms the most complete and authoritative account of all medical aspects of the 1939–1945 War to be published in the United Kingdom.

The volumes comprising this Medical History fall into three main groups:

THE CLINICAL VOLUMES, edited by Sir Zachary Cope.

THE FIGHTING SERVICES VOLUMES, edited by J. L. S. Coulter, F. A. E. Crew and S. C. Rexford-Welch.

THE CIVILIAN SERVICES VOLUMES, edited by C. L. Dunn, Sir Arthur S. MacNalty, F. H. K. Green and Sir Gordon Covell.

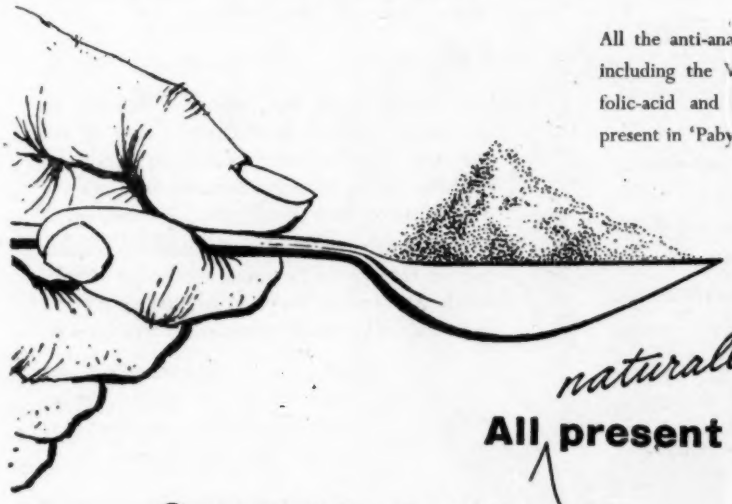
Volumes already published:

Medicine and Pathology 50*s.* (*by post* 51*s.* 1*d.*)
Surgery 80*s.* (*by post* 81*s.* 6*d.*)
The Royal Naval Medical Services (Administration)
Volume I. 50*s.* (*by post* 51*s.* 2*d.*)
The Army Medical Services (Administration)
Volume I. 50*s.* (*by post* 51*s.* 2*d.*)
The Emergency Medical Services
Volumes I and II. Each 50*s.* (*by post* 51*s.* 2*d.*)
The Civilian Health and Medical Services
Volume I. 45*s.* (*by post* 46*s.* 2*d.*)
Medical Research 40*s.* (*by post* 41*s.* 2*d.*)
The Royal Air Force Medical Services (Administration)
Volume I. 70*s.* (*by post* 71*s.* 6*d.*)

In preparation:

The Civilian Health and Medical Services
Volume II. *Ready March 3rd*
The Royal Naval Medical Services (Campaigns)
The Army Medical Services (Administration)
Volume II
The Army Medical Services (Campaigns)
Volumes I, II, III and IV
The Royal Air Force Medical Services (Commands)
The Royal Air Force Medical Services (Campaigns)
Medical Statistics (Fighting and Civilian Services

HER MAJESTY'S STATIONERY OFFICE



All the anti-anæmia factors in whole liver including the Vitamins of the B-complex, folic-acid and Vitamin B_{12} are naturally present in 'Pabyrn' Proteolysed Liver.

naturally

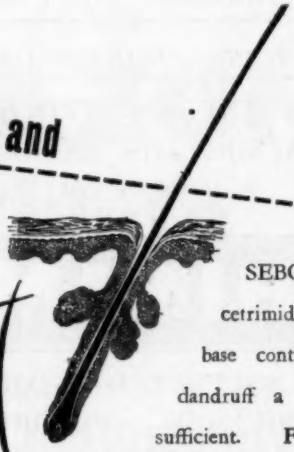
All present and correct

Concentrated, palatable, easily assimilable; especially indicated in anæmias refractory to other hæmatinics: also as a high protein supplement. Literature and samples on request.

Pabyrn Proteolysed Liver

PAINES & BYRNE LTD., Greenford, Middlesex

Specifically for Dandruff and Seborrhoeic Dermatitis



The quaternary ammonium compound, Cetrimide, is specifically recommended for the treatment of seborrhoeic dermatitis in cases where soap shampoos are irritant*

SEBODERM
CETRIMIDE SHAMPOO

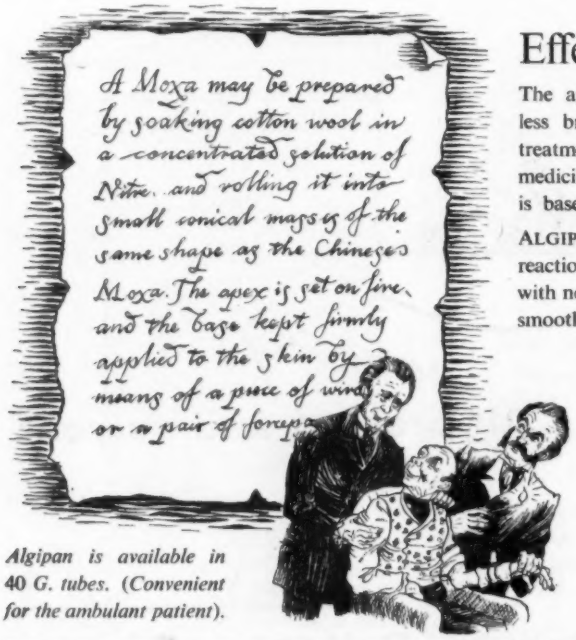
in ¾-oz. tubes

SEBODERM contains 15.6% of cetrimide in an elegantly emulsified base containing lanolin. For simple dandruff a single weekly treatment is sufficient. For seborrhoeic dermatitis, however, treatment should be on alternative nights until there is improvement in the condition.

Literature and Professional Sample on request from:—

Brit. Med. J. 1951, **2**, 1070.

PRIORY LABORATORIES LTD.
Priory Works, West Drayton, Middlesex


A Moxa may be prepared by soaking cotton wool in a concentrated solution of Nitre and rolling it into small conical masses of the same shape as the Chinese Moxa. The apex is set on fire, and the base kept firmly applied to the skin by means of a piece of wire or a pair of forceps

Algipan is available in 40 G. tubes. (Convenient for the ambulant patient).

Effective

The application of heat, though fortunately by less brutal methods, is extensively used in the treatment of non-articular rheumatism in physical medicine to-day, for this counter-irritant practice is based upon firm physiological foundations.

ALGIPAN Balm *effectively* reproduces the vascular reaction common to the topical application of heat, with no more effort than that required to rub this smooth clean histamine cream lightly into the skin.

ALGIPAN is non-greasy, will not stain or damage clothes, has no objectionable odour and is harmless to the most sensitive skin.

'Algipan'
Trade Mark
BALM

JOHN WYETH & BROTHER LIMITED, *Clifton House, Euston Road, London, N.W.1*

Advertised and Introduced ONLY to the Medical Profession

NASO-PHARYNGEAL AFFECTIONS

TREATMENT AND PROPHYLAXIS OF RHINITIS, CORYZA, SINUSITIS, RHINO-PHARYNGEAL CATARRH, INFLUENZAL AFFECTIONS

RHINAMID BAILLY

AQUEOUS ISOTONIC SOLUTION OF SULPHANILAMIDE, EPHEDRINE HYDROCHLOR, AND A LOCAL ANAESTHETIC

APPLY BY INSTILLATION OF DROPS OR BY ATOMIZER
BASIC N.H.S. PRICES— 35 c.c. Dropper Bottle - 2/7½d.
Dispensing Pack 8 fl. ozs. - 10/-. Dispensing Pack 80 fl. ozs. - 80/-.

BAILLY LTD., LONDON
Sole Concessionaires:* BENGUE & CO., LTD., *Manufg. Chemists
MOUNT PLEASANT, ALPERTON, WEMBLEY, MIDDLESEX

When diet is *important*...

— the Energen Dietary Service can give *immediate* advice and help. Special diets for individual cases can be prepared or standard diet cards for common ailments—replaceable as required—are available in an indexed filing box (as shown here). Personal consultations can be arranged with the Senior Dietitian, and a special 40-page book on specific dietary problems, "Diet and the General Practitioner," will be sent on request. All these services are free of charge to practitioners throughout the United Kingdom. For further details, write or telephone the Secretary,

ENERGEN DIETARY SERVICE

25a BRYANSTON SQUARE, LONDON, W.1 (AMBassador 9332)

This Diet Card File is free of charge to practitioners.

SANCTIONED ON N.H.S. PRESCRIPTIONS (FORM E.C.10)

EPHAZONE tablets

The rational, symptomatic remedy for bronchial spasm in

ASTHMA & BRONCHITIS

Containing in each tablet: Ephedrine ¼ grain, Theobromine ½ grain, Phenazone 1 grain, Calcium gluconate ¼ grain

This preparation is not advertised to the general public. Please write for descriptive leaflet and sample to the manufacturers:

EPHAZONE LTD 59 BROOK ST. LONDON W1 TEL: MAYFAIR 5496

THE WASHINGTON CHEMICAL CO. LTD.

has been making Magnesium Chemicals
of quality for the
Pharmaceutical Industry
since the ophthalmoscope was first used.

THE WASHINGTON CHEMICAL CO. LIMITED · WASHINGTON · CO. DURHAM

A member of the TURNER & NEWALL ORGANISATION

In the Service...

Research

The House of Wander continues to maintain its advanced position in pharmaceuticals and quality food products because the standardization of active ingredients during manufacture is backed by careful control and investigation in its extensive Research Laboratories.

In Quality

The Wander Research Laboratories have made useful contributions in the fields of dietetics, nutrition and vitamins. Their wide experience and up-to-date laboratory facilities help to maintain the high quality of Malt Extract and Cod Liver Oil (Wander) the vitamin content of which exceeds that of the analogous B.P. preparations.

The special consideration of physicians when prescribing a malt and oil preparation is that of vitamin values. Comparative studies prove that to prescribe "Wander Brand" is to specify malt extract and cod liver oil of the finest possible quality.

In the Service of Medicine

Careful control and investigation help to maintain "Wander Brand" in the forefront of its class. Moreover, with all its special advantages, "Wander Brand" costs no more than some malt and oil preparations with a lower vitamin content.

A. WANDER LTD.
LONDON W.1.

℞ Malt & Oil (WANDER)

M.352

EASILY ASSIMILATED IRON

For hypochromic anaemia in all ages and conditions, particularly in pregnancy, childhood, adolescence and advancing age, Ferraplex B provides easily assimilated iron supplemented, for maximum haematinic effect, with copper, vitamin C and complete vitamin B complex. Side effects such as gastro-intestinal disturbances are rare.

Available in bottles of 50 and 250 tablets.
Basic N.H.S. cost of 250 tablets, 15/6d.
Average daily cost of treatment, 4½d.

The recommended daily dose of six FERRAPLEX B *tablets contains:—*

Ferrous sulphate exsicc., B.P.	1 gramme
Copper carbonate	2 mg.
Ascorbic acid (Vitamin C)	50 mg.
Natural vitamin B complex extract	2 grammes
prepared from Brewers' Yeast and including	
Aneurine hydrochloride	3 mg.
Riboflavine	6 mg.
Nicotinamide	30 mg.

and pantothenic acid, pyridoxine, folic acid, choline, inositol, biotin, para-aminobenzoic acid and other naturally occurring factors of the vitamin B complex.

FERRAPLEX B

BENCARD

C. L. BENCARD LTD.
PARK ROYAL · LONDON · N.W.10
Telephone: ELGar 6681.
Telegrams: Bencarlond, Harles, London.

For Nasal Decongestion . . .

Discriminate use of the 'Neophryn' Spray helps to restore normal nasal function and is probably the best short-term local treatment. Principal advantages are: rapid and prolonged vaso-constriction without secondary congestion, virtual freedom from side-effects and simple administration by a convenient plastic atomiser. 'Neophryn' is also available as Nasal Drops in a half-ounce bottle with dropper.

Neophryn
Trade Mark

Manufactured by BAYER PRODUCTS LIMITED · NEVILLE HOUSE · KINGSTON-ON-THAMES · SURREY

Associated export company: *WINTHROP PRODUCTS LIMITED*

'AVLOPROCIL' DRY

NOTEWORTHY FEATURES:

- ★ An aqueous suspension, ready for use, is very speedily obtained when water for injection is added.
- ★ The prepared suspension is easy to inject, causes the minimum of pain and there is no risk of needle blockage.
- ★ The presence of a bacteriostat ensures sterility.
- ★ The suspension shows no tendency to "clay" even after prolonged storage and only requires to be shaken before it is again ready for injection.
- ★ The suspension retains its full potency for at least one month after preparation when stored at temperatures not exceeding 25°C. (77°F.)

'Avloprocil' formulations have long been known to doctors for their high quality and reliability. **'Avloprocil' Dry** is the latest addition to the range. It presents the procaine salt of penicillin G as a stable, dispersible powder from which an aqueous injection can be readily prepared.

'Avloprocil' Dry can always be relied upon as an effective means of obtaining a sustained therapeutic level of penicillin in the blood.

A SUPERIOR PROCAINE PENICILLIN FOR INJECTION

ICI

Available as: ***Single-dose*** *vials of 300,000 units*
Triple-dose *vials of 900,000 units*
Multi-dose *vials of 3,000,000 units*

Available under the National Health Service at Ministry of Health Drug Tariff prices.

IMPERIAL CHEMICAL (PHARMACEUTICALS) LTD., Fulshaw Hall, Wilmslow, Manchester

A subsidiary company of Imperial Chemical Industries Ltd.

Ph. 503

The advantages of FENOX nasal drops

Fenox gives two-stage vasoconstriction—prompt and sustained—without side effects

Fenox is non-oily—no interference with ciliary action, no danger of lipoid pneumonia

Fenox remains at the site of action —same viscosity as mucus

Fenox is non-irritant —*p*H adjusted and isotonic with nasal secretion.

Fenox is readily absorbed by the mucosa— low surface tension.

Fenox is suitable for both children and adults.

THE IDEAL NASAL DECONGESTANT

FENOX, the only preparation containing phenylephrine hydrochloride *and* naphazoline nitrate, marks an advance in the local treatment of catarrhal conditions of the nasal passages and accessory sinuses. It exhibits all the properties of the ideal nasal decongestant.

FENOX is supplied in ½ fl. oz. dropper bottles.

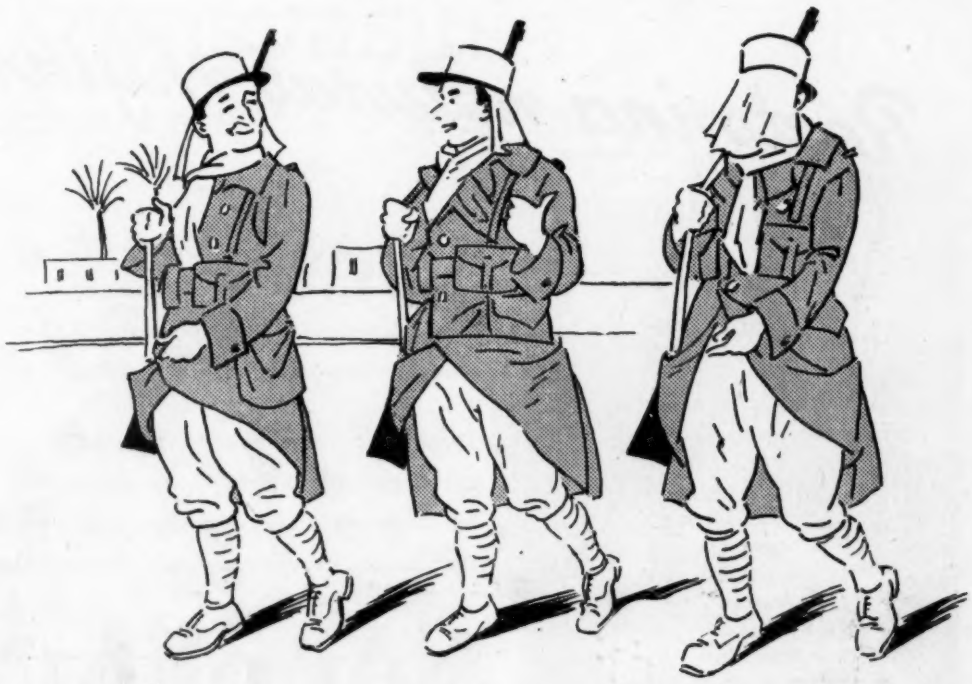
BASIC N.H.S. PRICE 1/8d.

Literature and "Patients' Directions" pads are available from the Medical Department, Boots Pure Drug Co. Ltd. Nottingham

Boots

8191

12



Joining the Foreign Legion...

is all very well as a means of forgetting a few debts, or a wife or two. But, even there, the acne sufferer will find himself unable to forget the embarrassment which caused his flight. In fact, despite the Legion's great qualities, as a treatment for acne it smacks of 'shot-gun' therapy.

Although 'Eskamel' is an unromantic alternative it does, at least, improve the patient's appearance while treatment is proceeding. Moreover, its maximum effect is exerted not in the six years of a Legion engagement, but in a matter of days.

'ESKAMEL' *for acne*

Available only in specially lined 1 oz. tubes

For cost to N.H.S., please see M. & J. list of costs dated January, 1955

SMITH, KLINE & FRENCH INTERNATIONAL CO.
represented by
MENLEY & JAMES, LIMITED, COLDHARBOUR LANE, LONDON, S.E.5
Tel: BRIxton 7851

'ESKAMEL' is a registered trade mark

EMP25

Restoring natural rhythm

Senna is a neuro-muscular stimulant of peristalsis and produces a good imitation of normal defaecation. Such a physiological effect is of great value in restoring natural rhythm.

Through the production of Senokot, the first stable, standardised preparation of senna, the full therapeutic activity of the drug has been made available and its re-educative effect demonstrated.

Senokot

REGD.

STANDARDISED SENNA GRANULES

Lancet, 1952, **1**, 655.
ibid 1953, **1**, 497 and 602.
Practitioner, 1953, **170**, 266.
Medical Press, 1954, **231**, 521.

Prescribed on E.C.10.
—*J.C.P. Category 3.*
—*Not advertised to the public.*
—*Inexpensive*

Sizes: 2 oz., 6 oz. and 2 lb.
Dosage: children ½-1 and adults 1-2 teaspoonfuls.

WESTMINSTER LABORATORIES LTD., CHALCOT ROAD, LONDON, N.W.1.

Transvasin

brings the esters of NICOTINIC ACID SALICYLIC ACID p-AMINOBENZOIC ACID to the focal point of soft-tissue rheumatism

The esters in Transvasin, a new preparation developed by Hamol S.A., our Swiss associates, readily pass the skin barrier in therapeutic quantities and enable an effective concentration of the drugs to be built up where they are needed. Transvasin not only induces vasodilation of the skin with a superficial erythema, but also brings about a deep hyperaemia of the underlying tissues. It is non-irritant, and can be safely used on delicate skins.

It is now being widely prescribed, with successful clinical results. Since a very small quantity is sufficient for each application, the cost of treatment is extremely low.

Salicylic acid tetrahydrofurfuryl-ester	14%
Nicotinic acid ethyl-ester	2%
Nicotinic acid n-hexyl-ester	2%
p-Aminobenzoic acid ethyl-ester	2%
Water-miscible cream base ad	100%

Transvasin is available in 1 oz. tubes, basic price 2/6 plus 7½d P.T., and is not advertised to the public. Samples and literature will be gladly sent on application.

LLOYD-HAMOL LTD., 11 Waterloo Place, London, S.W.1 WHItehall 8654/5/6

Transvasin is the registered trade mark of Lloyd-Hamol Ltd.

MALARIA–a bar to progress

Increasing evidence from endemic regions indicates that 'Daraprim' can play a major part in eradicating malaria. This new drug has proved an excellent suppressant in a dosage of one product once a week; when administered under supervision to an entire community it has been shown capable of breaking the malarial cycle. 'Daraprim' is tasteless and well tolerated; it causes no discoloration of the skin. It is supplied as compressed products of 25 mgm., in packs of 6, 30, 250 and 1000.

'DARAPRIM'

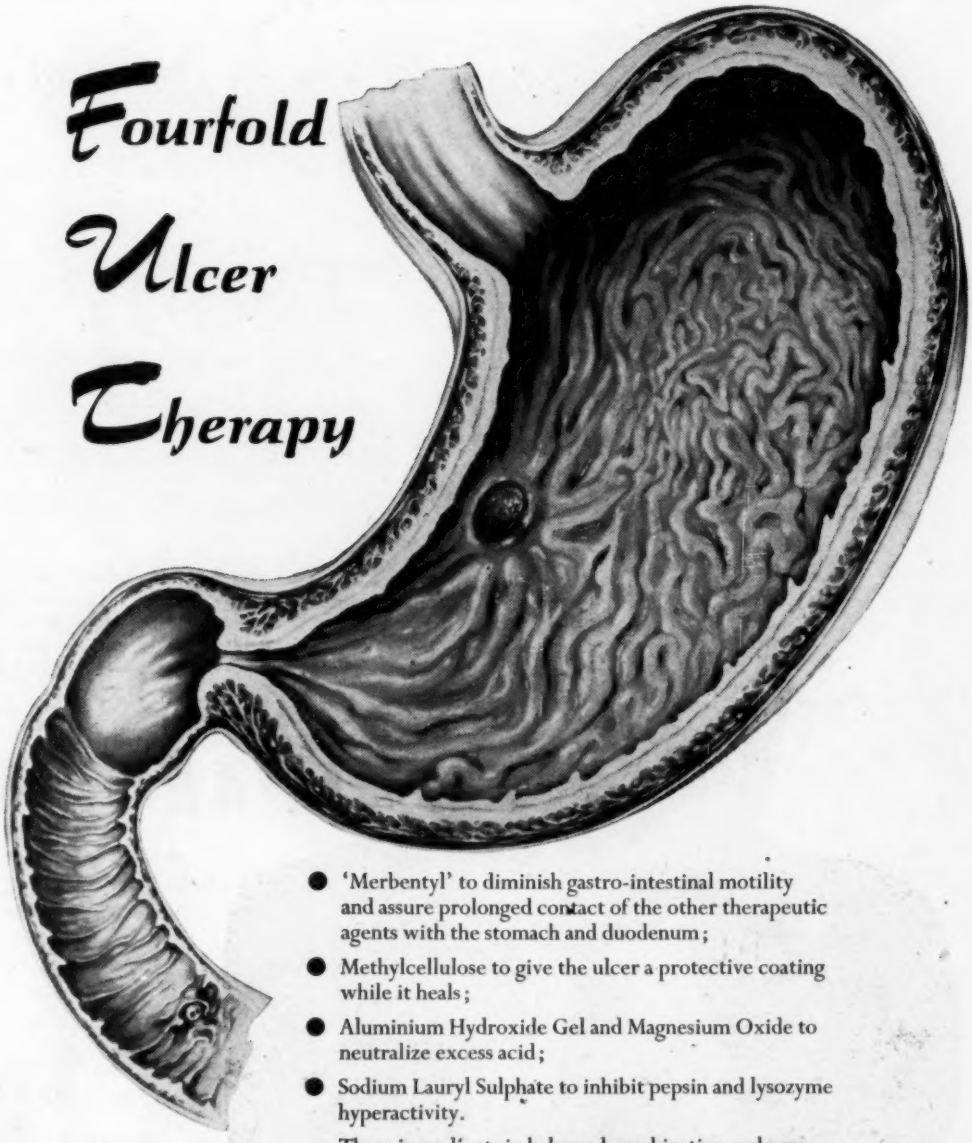
PYRIMETHAMINE

Issued in the French Union and in Tunisia and Morocco as 'Malocide' brand Pyrimethamine

BURROUGHS WELLCOME & CO. (THE WELLCOME FOUNDATION LTD.) LONDON

ASSOCIATED HOUSES: NEW YORK · MONTREAL · SYDNEY · CAPE TOWN · BOMBAY · BUENOS AIRES · CAIRO · DUBLIN · AUCKLAND

Fourfold Ulcer Therapy



- 'Merbentyl' to diminish gastro-intestinal motility and assure prolonged contact of the other therapeutic agents with the stomach and duodenum;
- Methylcellulose to give the ulcer a protective coating while it heals;
- Aluminium Hydroxide Gel and Magnesium Oxide to neutralize excess acid;
- Sodium Lauryl Sulphate to inhibit pepsin and lysozyme hyperactivity.

These ingredients in balanced combination make up the new and highly effective peptic ulcer medicament.

Each tablet contains:—

'Merbentyl' (diethylaminocarbethoxybicyclohexyl hydrochloride)	*5 mg.*
Aluminium Hydroxide Gel	*400 mg.*
Magnesium Oxide	*200 mg.*
Sodium Lauryl Sulphate	*25 mg.*
Methylcellulose	*100 mg.*

Bottles of 50 and 250 tablets.

KOLANTYL REGD

distributed in the United Kingdom & Eire by
RIKER LABORATORIES LIMITED, LOUGHBOROUGH, LEICS.
for the Wm. S. Merrell Company, London.

Merrell research

to live in freedom . . .

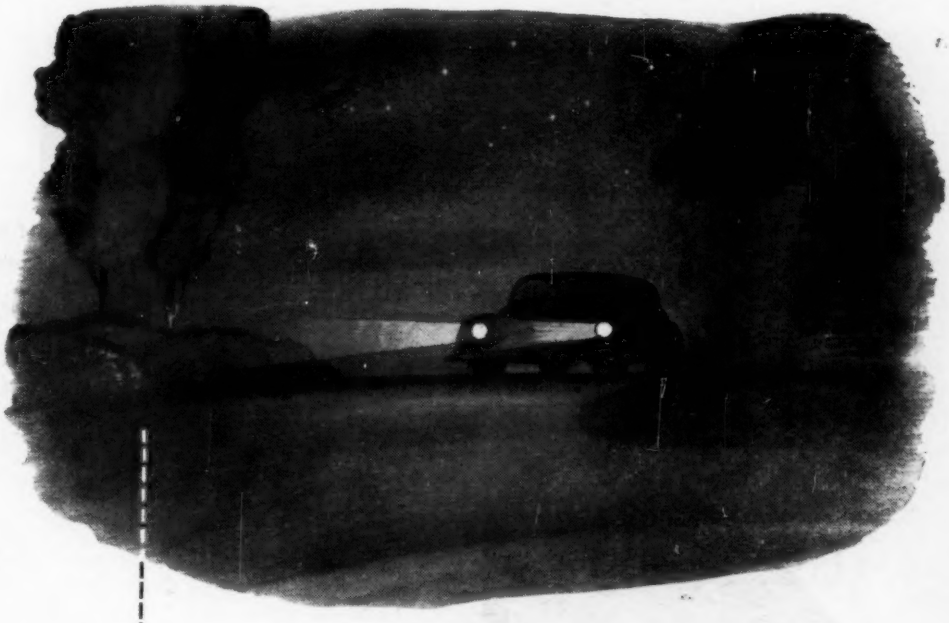
Treatment with EPANUTIN gives four out of five epileptics the freedom to live a normal life. It enables them to work as others do and to enjoy pleasures normally beyond their reach. It prevents or greatly decreases the severity of the patient's seizures with minimal hypnotic or narcotic effects. In cases where an added sedative effect is necessary EPANUTIN & PHENOBARBITONE is an effective combination.

Epanutin & Phenobarbitone capsules containing 0.1 g. (1½ grains) Epanutin (phenytoin sodium) with 0.05 g. (¾ grain) phenobarbitone may also be usefully employed in the transition from phenobarbitone to Epanutin.

EPANUTIN

● Epanutin Capsules (1½ grs.) and Epanutin with Phenobarbitone Capsules are obtainable in bottles of 100 and 1,000.

PARKE, DAVIS & Company, Limited *(Inc. U.S.A.)*, Hounslow, Middlesex. Tel.: Hounslow 2361



Two better than one

Side by side, the antibiotics gramicidin and polymyxin B cover both Gram-negative and Gram-positive pathogens of the upper respiratory tract. Because they are so rarely used systemically there is little risk of jeopardizing the treatment of subsequent grave systemic infections.

NEW *in upper respiratory tract infections*

PRINEXIN *In 15 ml. bottles, with dropper*

Gramicidin, 0·005 per cent.
Polymyxin B sulphate, 500 i.u. per ml.
Thenylpyramine hydrochloride, 0·2 per cent.
in isotonic solution of hydroxyamphetamine hydrobromide ('Paredrinex'), 1 per cent.

SMITH KLINE & FRENCH INTERNATIONAL CO.

represented by

MENLEY & JAMES, LIMITED, COLDHARBOUR LANE, LONDON, S.E.5. Tel: BRIxton 7851

PEP15

'Prinexin' and 'Paredrinex' are registered trade marks

Introducing a NEW preparation for the symptomatic relief of asthma

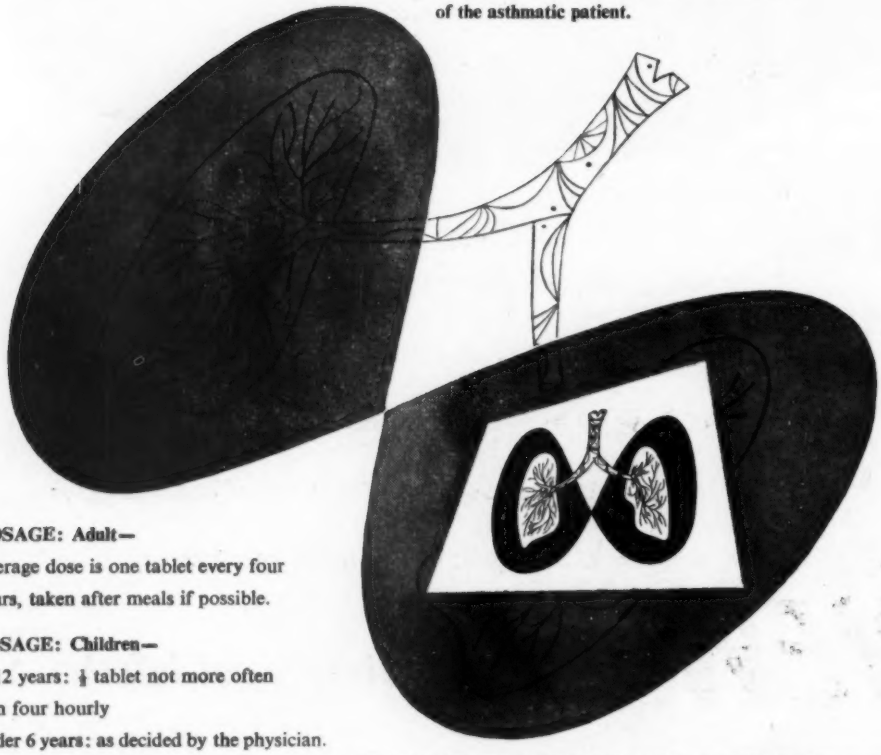
...Tedral

Tedral offers in a single tablet, the combined effects of three drugs, each of them valuable for the symptomatic relief of asthma.

THEOPHYLLINE, to relax the spasm of the bronchial musculature.

EPHEDRINE HYDROCHLORIDE, to relieve oedema of the bronchial mucosa in addition to relaxing the bronchial muscles.

PHENOBARBITONE, to relieve the anxiety of the asthmatic patient.



DOSAGE: Adult—
Average dose is one tablet every four hours, taken after meals if possible.

DOSAGE: Children—
6-12 years: ½ tablet not more often than four hourly
Under 6 years: as decided by the physician.

PACKING AND PRICES:
Tedral is supplied in bottles of 50 and 500 tablets. The dispensing pack of 500 Tedral tablets is supplied to chemists at 26/-, and 29/- each Enteric Coated.

TEDRAL ENTERIC COATED is also available to give symptomatic relief of asthma four hours after administration.

TEDRAL ENTERIC COATED is therefore indicated for administration to the patient with nocturnal asthma.

DOSAGE: 1 tablet of Tedral and 1 tablet of Tedral Enteric Coated on retiring, give eight hours symptomatic relief of asthma.

No Warner preparation has ever been advertised to the public.

WILLIAM R. WARNER & CO. LTD., Power Road, London, W.4.

BUTAZOLIDIN
Regd. Trade Mark

in osteoarthritis

Butazolidin in small doses has been found effective in the majority of cases of osteoarthritis. Relief from pain is usually experienced within a few days of commencing treatment and improvement in mobility of an affected joint is often of a greater degree than can be accounted for by analgesia alone. Osteoarthritis of the hip is particularly responsive to treatment with Butazolidin.

Prescribable on N.H.S. Form E.C.10. Butazolidin is included in schedules 1 and 4 of the Poison Regulations. Available in tablets containing 100 mg. and 200 mg. and in solution for injection in ampoules of 5 ml. containing 1000 mg.

Detailed literature is available on request.

BUTAZOLIDIN—NEW TABLET SIZE

From February 15th, 1955, Butazolidin tablets will be smaller. This alteration is being made to standardize the size of tablet throughout the world. The tablets will remain unchanged in all other respects. It is particularly emphasized that the strengths of Butazolidin tablets will remain exactly as before.

Geigy

GEIGY PHARMACEUTICAL COMPANY LIMITED
Rhodes, Middleton, MANCHESTER

PH. 68d

The original Lente Insulins

NOVO

Novo Lente Insulin

Novo Semilente Insulin

Novo Ultralente Insulin

All available in 40 and 80 units per ml.

EVANS MEDICAL

EVANS MEDICAL SUPPLIES LTD · LIVERPOOL AND LONDON

22

A new cough specific

(Sodium 2:6 ditertiarybutylnaphthalene Monosulphonate)

suppresses cough with no undesirable side-effects

SODIUM 2:6 ditertiarybutylnaphthalene Monosulphonate (Becantyl), a product of original research, is a new agent that is specific in suppressing cough. It is unrelated to morphine and guaiacol.

BECANTYL does not cause constipation, anorexia, drowsiness or any undesirable side-effects; being devoid of side-effects BECANTYL may be prescribed for infants, children, and the aged.

Clinical experience supports the value of BECANTYL in suppressing all types of cough, and shows that it does not suppress expectoration.

BECANTYL may be used in the treatment of all types of cough. There are no contra-indications to its use.

BECANTYL is presented in 4 fluid ounce, 40 fluid ounce, and 80 fluid ounce bottles.

Samples and literature on request

BIBLIOGRAPHY

Contribution a l'étude pharmacologique et toxicologique du butylnaphtalène sulfonate sodique ou L 1633.
Arch. int. Pharmacodyn 1954, **97**, 34

D'un nouveau sédatif de la toux.
Thèse de doctorat, Paris, June 1952

Bécantex in der Behandlung des Hustens bei Tbc-Patienten.
Praxis 1953, **42**, 974

La toux et son traitement symptomatique.
Semaine des Hôpitaux 1953, No. 60, 2999

Arch. f. exp. Pathol. u. Pharmakol 1940, **194**, 621

Proc. Soc. exp. Biol. u. Med. 1952, **81**, 463

A propos des sédatifs de la toux.
Revue du Praticien 1954, No. 7

Becantyl

HORLICKS LTD. PHARMACEUTICAL DIVISION
SLOUGH, BUCKS.

BECANTYL *is the Registered Trade Mark of the Société des Laboratoires Labaz*

Neuro-vegetative Dystonia

responds readily to treatment with

BELLERGAL

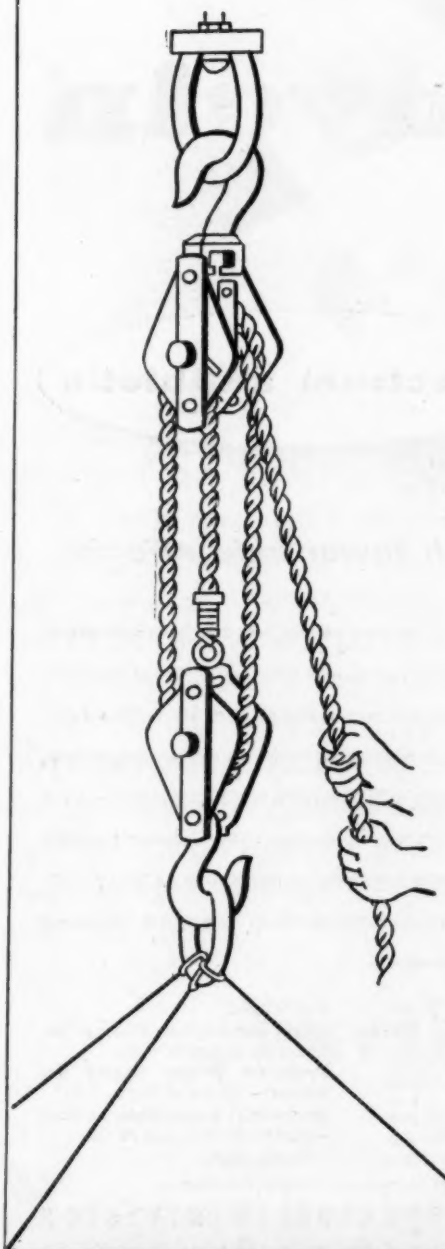
Each Bellergal tablet contains a vagal inhibitor (0.1 mg. Bellafoline), an inhibitor of adrenergic impulses (0.3 mg. Ergotamine Tartrate B.P.) and a sedative of the autonomic nervous centres in the brain stem (0.02 g. Phenobarbitone B.P.). Bellergal therefore exerts a sedative effect on the entire autonomic nervous system.

Indications for Bellergal therapy:

- ★ **Neuro-vegetative dystonia**
- ★ **Menopausal disturbances**
- ★ **Dysmenorrhoea**
- ★ **Pink disease**
- ★ **Motion sickness**

Literature and samples SANDOZ *available on request*

SANDOZ PRODUCTS LIMITED
134, Wigmore Street, London, W.1



Avoiding Resistant Strains...

Particular emphasis has been given to the use of combined chemotherapy in the treatment of infections, and it has been realised that there is considerable merit in the judicious combination of antibiotics and sulphonamides in the prevention of bacterial resistance.

To aid the Practitioner, Allen & Hanburys have introduced two combinations of drugs known to exhibit mutual reinforcement.

SULPENIN

FOR COMBINED ORAL PENICILLIN AND SULPHONAMIDE THERAPY

and

GUANIMYCIN

FOR COMBINED ORAL STREPTOMYCIN AND SULPHAGUANIDINE THERAPY

ALLEN & HANBURYS LTD · LONDON · E·2

TELEPHONE: BISHOPSGATE 3201 (20 LINES). TELEGRAMS: "GREENBURYS, BETH, LONDON"

Achromycin*

TETRACYCLINE

today's true broad-spectrum antibiotic

greater striking power with fewer side effects

More rapidly absorbed.

Quicker diffusion in body tissues.

Fewer side effects.

Greater stability.

On all counts—effectiveness, range of activity, freedom from side-effects—ACHROMYCIN tetracycline has set new standards in broad-spectrum antibiotics. No other broad-spectrum antibiotic is so stable, so soluble . . . none can match the high blood concentrations and prolonged antibacterial levels achieved with ACHROMYCIN. The antibacterial range of ACHROMYCIN is equally outstanding—indeed, every organism sensitive to broad-spectrum antibiotics responds equally well to ACHROMYCIN. Yet, extensive clinical trials have shown this drug to be almost completely free from undesirable side-effects.

ACHROMYCIN (TETRACYCLINE) a true broad-spectrum antibiotic

Tablets 50 mg. Vials of 25 and 100; 250 mg. Vials of 16, and bottles of 100.
Capsules 50 mg.—Vials of 25 and 100. 250 mg.—Vials of 16, bottles of 100.
Intramuscular Vials of 100 mg.
Intravenous Vials of 250 mg. and 500 mg.
Oral Suspension Cherry flavoured—Bottles of 1 oz.
Pediatric Drops Cherry flavoured—Bottles of 10 cc.
Spersoids† Dispersible powder—Jars of 36 Gm. and 75 Gm.

* Regd. Trade-Mark
† Trade-Mark

Achromycin is at present only available to hospitals.

Lederle

LEDERLE LABORATORIES DIVISION
Cyanamid Products Ltd.
BUSH HOUSE · ALDWYCH · LONDON, W.C.2. TEMPLE BAR 5411

FOR SUPPRESSION OF

severe cough

'PHYSEPTONE' LINCTUS has many advantages as a suppressant of unproductive cough. Though comparable in effectiveness to diamorphine linctus, it is free from the drawbacks of the latter—it carries negligible risk of addiction, does not constipate and seldom causes other side-reactions.

'PHYSEPTONE' LINCTUS has a direct suppressive action on the cough reflex. It is especially valuable in such conditions as bronchiectasis, pertussis, post-influenzal tracheitis, chronic passive pulmonary congestion and pulmonary tuberculosis.

'PHYSEPTONE' LINCTUS contains 2 mgm. of methadone hydrochloride in each fluid drachm (the recommended adult dose). For children it should be diluted with simple syrup in the proportion of one part linctus and seven parts syrup—one to two teaspoonfuls (0·25—0·5 mgm.) of this *diluted* linctus to be given according to the age of the child.

'PHYSEPTONE' LINCTUS

BRAND

BURROUGHS WELLCOME & CO. (THE WELLCOME FOUNDATION LTD.) LONDON

A new treatment for threadworm and roundworm infestation

'Entacyl' is a particularly effective anthelmintic. Its action is rapid. Its taste is pleasant. Its administration is not accompanied by nausea or other side effects even in very young children. Complete eradication is obtainable without the use of an enema.

DOSAGE: *1 tablet per year of life per day up to the age of six years. Over six years of age 2 tablets three times a day. This dosage should be administered for one week.*

Pads of instruction leaflets intended to be handed to patients undergoing treatment with Entacyl are available on request.

'ENTACYL' TRADE MARK

Tablets containing Piperazine Adipate 300 mg.
(Brit. Pat. Appn. No. 29123/53)

Basic N.H.S. prices:
Bottles of 25 at 3/- and 100 at 10/-

Fully descriptive literature and specimen packings are available on request.

Medical Department

THE BRITISH DRUG HOUSES LTD. LONDON N.1

Ent/E/541

B.C.G. VACCINATION*

F. R. G. HEAF
M.D. Camb., F.R.C.P.
DAVID DAVIES PROFESSOR OF TUBERCULOSIS, UNIVERSITY OF WALES

B.C.G. vaccination has been a source of controversy ever since it was introduced by Calmette in 1922. Most of those who have studied the subject believe that such vaccination confers considerable protection against tuberculosis; but the extent of this protection cannot be precisely assessed, owing to our ignorance of allergy and immunity in tuberculosis, and the great difficulty of defining the importance of any one of the many social and medical factors in this disease.

The vaccine is reasonably inexpensive; and it is not difficult to prepare. Except in two cases recently recorded in Scandinavia (Thrap-Meyer 1954) it has not been known to cause progressive tuberculosis in man and the local reactions are usually slight. The technique of giving the vaccine is simple, but requires care. The contra-indications are few. There is strong evidence that it increases resistance against tuberculous infection, although statistical proof is difficult to obtain. These acknowledged advantages of the vaccine are sufficient to justify its use.

Manufacture and Cost of Vaccine

The vaccine is not manufactured officially in this country, because we obtain from Denmark a satisfactory product, quite regularly and at low cost. The vaccine must be prepared in an entirely separate laboratory, which must not be used for any other purpose. The staff should not be doing other bacteriological work that might lead to contamination of the vaccine with virulent organisms. All staff working in the laboratory must have a quarterly medical examination, including radiography of the chest and a laryngeal swab or gastric lavage; no person should be allowed to work in the laboratory, even as cleaner or porter, without undergoing such an examination. These precautions are necessary to prevent another Lübeck disaster.

To establish such a laboratory requires considerable expenditure and organisation. While a very good and cheap supply can be obtained regularly from Denmark or France, there does not seem to be much point in asking the Treasury to allocate a considerable sum of money for this purpose. Manufacture of the vaccine commercially has never been favoured by W.H.O. or any of the governments of countries where the vaccine has long been used. But there can be no serious objection to a firm making freeze-dried vaccine, since this product, owing to its comparatively long life, can be subjected to biological and bacteriological examination before being issued.

Allowing for wastage, the cost of the vaccine itself at present works out at about 3½*d.* per injection for the fresh vaccine, and at about 2*d.* for the freeze-dried product. The average cost of vaccinating members of a group depends on the number tuberculin-tested and the number found to require vaccination. In the International Tuberculosis Campaign (1952), during which many millions were vaccinated, it cost 7*d.* to tuberculin test and 1*s.* 1*d.* to vaccinate each person; while at St. Ultan's Hospital, Dublin (1953), the figure in 1952 was 2*s.* for tuberculin testing and 7*s.* for vaccination. It has not been possible, up to the present, to give a figure for this country.

Standardisation of Vaccine

B.C.G. is a living vaccine, whose potency depends on the strain of the bacillus and the number of viable units contained in the inoculum. The accuracy of the viable count is of great importance. Methods have improved, and the quantitative error in the Danish vaccine over a series of batches is now probably no more than 30%. To this must be added the possible variation in the volume of vaccine injected intradermally, and also the possibility of clumping.

It is not improbable that in individual vaccinations the number of bacilli injected may vary by as much as 100%; and it is therefore difficult to make comparable observations. The variation in the bacillary content of the ampoules, which in the past has been as much as a hundredfold, is one cause of the spasmodic appearance of severe local reactions. Furthermore, the allergy-producing power of the organism is related to the strain, the medium on which it is cultured, the age of the culture, and also the grinding to which the culture is subjected. These are intricate bacteriological processes; and unless they are made more uniform there will continue to be considerable variation between the vaccines issued by different laboratories.

It has become evident that vaccines produced in Europe differ from those produced in South America. For instance, oral vaccination with the Dutch vaccine produced adenitis much more commonly than with the vaccine from Brazil. The vaccine from Mexico is distinctly less potent than that from Denmark.

In Dublin, where Danish vaccine is used, Dunlevy (1954) has found that the rate of relapse to tuberculin anergy at the end of one year is 1·8%. In other parts of Ireland, where Swedish vaccine is used, the rate is 20·72%. This great difference may be partly due to differences in technique or in inherent resistance of the populations. The dose of the Swedish vaccine is only two-thirds that of the Danish, and this will influence the relapse-rate as it is doubtful if there is a corresponding difference in the potency of the two vaccines.

There appears to be no great variation between freeze-dried preparations. This may be due to their stability after lyophilisation. The Japanese strain (Research Committee of Tuberculosis, Japan, 1954) appears to have a slightly better power of producing tuberculin allergy than the French vaccine, possibly because younger cultures are used.

Life of Vaccine

The life of the fresh vaccine is short. Birkhaug and Darricarriere (1953) have shown that the bacilli begin to die after ten days. Whether this is important depends on the immunity conferred by injection of dead bacilli. According to Palmer (1952) the presence of dead bacilli enhances the development of tuberculin-sensitivity, but that does not necessarily mean that the conferred immunity is greater.

Although the tuberculin-sensitivity after injection of mixed suspensions of live and dead B.C.G. may be greater than that after injection of live bacilli alone, there is little evidence that the duration of sensitivity is greater, or that the antibody response is as good. Until further work has been done, it is necessary to ensure a minimum amount of living bacilli in each inoculum, which according to Sayé (1953) should not be less than one million organisms.

I agree with Birkhaug that the liquid vaccine should be used as fresh as possible, and all the memoranda of the Ministry of Health have emphasised the need for this quite forcibly. Certainly the vaccine should not be used later than fourteen days from the date of preparation. Edwards and Tolderlund (1952) have shown that the vaccine is particularly susceptible to light, and also to some extent to heat, so the cold transport and storage in cool dark places is important.

Although the freeze-dried vaccine, as prepared in the past, is a poorer antigen than the fresh vaccine, it is

* Litchfield lecture, delivered at the Radcliffe Infirmary, Oxford, on Nov. 10, 1954.

more stable and may be used up to six months from the date of preparation. It is also less susceptible to light. This instability of the vaccine to light and heat requires careful attention to technique, particularly in tropical countries.

Evidence of Protection

The object of B.C.G. vaccination is to raise the body's resistance to tuberculous infection, particularly to primary infection by virulent bacilli. There have been many controlled trials; but so far none is above statistical criticism, and we shall have to wait another two or more years for the results of the trials organised by the Medical Research Council.

Observations in different countries indicate that non-vaccinated tuberculin-negative subjects are more likely to develop active tuberculosis than comparable vaccinated people, in the ratio of about 6 to 1. This figure has been arrived at by studying the results of ten surveys in different parts of the world in the years 1940 and 1953 (see Irvine 1954). Statisticians will frown on such haphazard calculations, but I think the figures indicate quite definitely that B.C.G. vaccination does offer considerable protection against the development of primary tuberculosis. Vaccination exerts little control over the development of postprimary lesions, although in some surveys the incidence and severity of these is apparently less in the vaccinated than in the unvaccinated. So many factors influence the development of postprimary tuberculosis that I doubt whether it will ever be possible to study comparable groups for a long enough period to obtain accurate information on the remote effects of vaccination.

Active tuberculosis may develop in the vaccinated if the infecting dose of tubercle bacilli is large enough to overcome the resistance conferred by the vaccination.

Recently, considerable evidence has been brought forward to show that B.C.G. may have some influence in protecting against leprosy. This is based on the fact that the vaccine will produce a positive lepromin reaction as well as a positive tuberculin reaction. The difficulty lies in interpreting the lepromin reaction, which is by no means a simple manifestation of bacterial allergy. Little definite can at present be stated, except that tuberculin and lepromin allergy are related.

Programme

At the beginning of the B.C.G. scheme in this country, one of the great drawbacks to the use of the vaccine was the elaborate precautions that were considered necessary (Ministry of Health 1950). We have learnt by experience that these precautions can be relaxed a good deal without great risk. For school-leavers, some local health authorities are attempting to reduce the procedure to the minimum for this country.

They advocate one pre-vaccination tuberculin test of 10 T.U. intradermally or by multiple puncture; then injection of B.C.G. to the negative reactors, and no post-vaccination tuberculin test, but only an inspection of the local lesion six weeks after vaccination. Other local authorities have decided to test a sample of those vaccinated.

The argument used for this policy is that the conversion-rate is so high that it is not worth doing the post-vaccination test to discover one or two per cent. non-converters. This is reasonable if there is substantial evidence of a satisfactory rate of permanent conversion in the area: in other words, in each area the conversion and reversion rates should be determined before the post-vaccination test is abandoned.

Hertzberg (1947, 1948, 1949) has shown that the diameter of the local lesion in non-converters was 0–2·5 mm. and that of those in whom the local lesion was 4 mm. or less only 56·4% were converted to tuberculin-sensitivity. Where the local lesion was 5 mm. or over, the conversion-rate was over 95%. McKinstry and Darling (1953) had a similar experience in Jersey. If it is necessary to eliminate, as far as possible, the post-vaccination test it would seem desirable to measure the local reaction six weeks after vaccination, and to test all those in whom it was less than 4 mm. in diameter. This would be better than the random sampling at present advocated in some areas.

In the Island of Timor, Oppers (1952) has dispensed with the pre-vaccination test and claims that no complications have arisen. There is general reluctance to accept this practice, but the objections to it have not been fully investigated. It is claimed that the vaccination of previously infected persons might activate an existing active lesion, or even reactivate a dormant lesion. It is also claimed that vaccination of tuberculin-sensitive persons will cause serious local lesions that take a long time to heal, and it is reasonable to surmise that in allergic persons the fixation and multiplication of the B.C.G. in the skin at the site of injection might cause lupoid lesions to develop.

Sayé (1953) in Barcelona has tested patients having active tuberculosis with 0·1 mg. doses of B.C.G. intradermally; no lupus or lupoid lesions have occurred, and the local Koch's phenomena have been mild and have not ulcerated or caused any troublesome symptoms.

Foley and Parrot (1954), who have studied this problem for the past twenty years, persistently maintain that no untoward results follow vaccination without tuberculin testing; yet they recommend that pre-vaccination tuberculin testing should be done wherever possible.

The problem resolves itself into estimating the harm that might arise from giving B.C.G. to persons with either active or healed tuberculous lesions. No harm has been reported after intradermal B.C.G. injections of 0·1 mg. in persons known to have active tuberculosis. Nor have there been many constitutional disturbances from mass oral vaccinations with freeze-dried French or Brazilian B.C.G. Where B.C.G. is used for treatment, the majority of patients show no reaction, but every now and again clinical symptoms occur.

Bøe, cited by Ustvedt (1950) also noted constitutional disturbances in tuberculous animals that were given B.C.G. injections.

Some light has been thrown on the process of superinfection by the treatment of active lesions with B.C.G. Gernez-Rieux et al. (1947) found that, in the majority of cases, no general reaction occurred; but occasionally the B.C.G. injection was followed by pyrexia, joint pains, rashes, and pleural effusion. The symptoms were similar to those after injections of tuberculin, so probably the reaction to injection of B.C.G. depends on the sensitivity of the tissues. In the hypos itive person no constitutional disturbance will take place, but in the hypersensitive there will be a constitutional response to the injection. May it not be that the future course of a superinfection with virulent tubercle bacilli might be foretold by the response of the tissues to avirulent B.C.G.? The possibility of using B.C.G. to assess resistance to infection has still to be explored.

Much depends on the dose and virulence of the bacilli injected, and it is unlikely that harm would arise from injecting 0·01 mg. of B.C.G. into tuberculous persons. It seems therefore possible to dispense with tuberculin in the B.C.G. programme, using instead the vaccine itself for testing sensitivity. I suggest that an initial injection of 0·01 mg. be given intradermally over the deltoid area, and that if no local reaction occurs in seventy-two hours a vaccination dose of 0·1 mg. be given at the same site. The multiple-puncture technique might be more satisfactory than the intradermal method. Then the initial test should be done with B.C.G. of the strength 1·0 mg. per ml. and the subsequent vaccination with 40 mg. per ml. Ustvedt (1950) has found B.C.G. too sensitive to determine sensitivity. By adjusting the strength of the

B.C.G. and the technique, this difficulty might be overcome. The very small dose of B.C.G. would be harmless in the infected person, while in the non-infected there would not be time for sensitivity from the test injection to develop before he was vaccinated. Insufficient attention has been given to Ustvedt's work on the diagnostic use of B.C.G. The appearance of an accelerated reaction or Koch's phenomenon would indicate tuberculous infection. If no local reaction appears by the second day after testing, it is highly probable that the person is free from tuberculous infection.

The confusion around the tuberculin test grows as investigations proceed. Palmer (1952) has stated that a considerable proportion of people giving a positive tuberculin test have not been infected by the tubercle bacillus. Conversely, most of us have seen the patient with clinically active tuberculosis who reacts only to low dilutions of tuberculin. The patch test is no longer regarded as reliable. Seibert and DuFour (1954) have recorded the qualitative differences between O.T. and P.P.D. It appears that the different antigens in the tuberculins exert their effects in people with different degrees of sensitivity.

GROUPS TO BE VACCINATED

Most workers agree that contacts of known cases of tuberculosis and those employed in hospital or clinic work should be offered B.C.G. vaccination. Young adolescents are another group requiring protection. But what about the newborn infant and the child up to five years of age? In this group the need for vaccination depends entirely on the incidence of infection in the area. It is most important that we do not vaccinate children unnecessarily; for not only is the infant already subjected to many injections, but mass B.C.G. vaccination prevents the use of tuberculin testing for case-finding and as an aid to diagnosis.

In a community where the prevalence of infection is 10% by the age of five years all possible protection against primary infection A, including vaccination, must be given to all children as the loss connected with the tuberculin test is then of secondary importance. In Oxford, from the recent survey of Fisher (1954), the population under five years of age shows only 0·5% positive to tuberculin. It is obviously unwise to vaccinate 99·5% of these children when the risk of becoming infected is so small.

The work of Gedde-Dahl (1952) with tuberculin in a case-finding survey is well known, and MacDougall et al. (1953) have shown how valuable this can be in Britain. Where the infection-rate is low, we cannot throw away lightly such a useful method of finding active cases. If the vaccination were 100% protective and permanent, it would be reasonable to suggest mass vaccination even in a country where the incidence of infection is low; but as this is not so, I think that for the present, in this country, it is best to limit the vaccination of infants to contacts. The matter must be determined by the incidence of infection and the risk of developing active tuberculosis.

B.C.G. vaccination is only one of many means of protecting the young child from tuberculosis. Furthermore, when infants and very young children are vaccinated, the protection will gradually decline and, unless reinfection takes place, a state of vulnerability through disappearance of tuberculin allergy will ensue. If the children revert to tuberculin anergy the consequences may be serious to them, particularly if they move to an area where they become exposed to virulent infection. A simple principle should control our vaccination policy. If a negative reactor is likely to be exposed to tuberculous infection, then he should be vaccinated with B.C.G. This applies particularly to emigrants from areas where the infection-rate is low to where this rate is high.

CONCLUSION

In the B.C.G.-vaccination programme there are certain limits of simplification beyond which, at present, it is unwise to go. A pre-vaccination test for allergy is necessary. Segregation is still advisable where the risk of infection is great in the pre-vaccination or post-vaccination period. Inspection of the local B.C.G. lesion at the end of eight weeks is essential, and the vaccinated should be tuberculin-tested. Special attention should be paid to those with a local lesion less than 4 mm. in diameter. Possibly the post-vaccination test may be eliminated in the future, and with oral vaccination we may some day dispense with pre-vaccination testing, but not before further knowledge has been obtained on the severity of Koch's phenomenon in relation to the type of vaccine and the method of administering it.

The need for segregation has caused much discussion, and one cannot do better than to repeat the advice given by the Ministry of Health—that segregation to prevent infection by virulent tubercle bacilli is desirable in the pre-allergic period, but it is better to vaccinate without segregation than not to vaccinate at all. Without segregation active tuberculosis will develop in a few cases shortly after vaccination, but B.C.G. vaccination schemes should not be prevented from developing because of this risk. As a general rule the problem arises only in contacts, and the risk should be assessed in each case. Where there is likelihood of exposure to massive and frequent doses of tubercle bacilli during the vaccination programme, then segregation is advisable for six weeks before, and six weeks after, the injection of B.C.G.

Timing of B.C.G. Vaccination

If one tries to immunise a body simultaneously with two different antigens, the formation of antibody to the inferior antigen may be considerably weaker than when immunisation is done with this antigen alone. With the two antigens given at the same time, one dominates the other. This was shown by Doerr and Berger (cited by Refvem 1954) as early as 1922. It is therefore important to separate B.C.G. vaccination from other immunological procedures so that tuberculin allergy may develop fully without any inhibition from other antigen-antibody processes. This applies particularly to smallpox vaccination, which should be done first and separated from B.C.G. vaccination by at least three weeks.

In certain areas B.C.G. vaccination has been suspended during outbreaks of poliomyelitis. Instances have been reported in which poliomyelitis developed at the same time as the B.C.G. lesion, or shortly afterwards. The circumstances have been investigated closely and there appears to be no reason to connect the poliomyelitis with the B.C.G. vaccination.

It would be unwise to vaccinate persons when recovering from measles or influenza, owing to the depressing effect of these infections on tuberculin-sensitivity.

Technique

The methods of B.C.G. vaccination have been admirably described by Irvine (1949, 1954).

One of the disadvantages is that it can be performed in at least four different ways. These are: (*a*) by oral administration, (*b*) by multiple puncture, (*c*) by scarification, and (*d*) by intradermal injection.

Oral Administration

This is the easiest method, but outside South America it is not favoured because of the resulting low and short-lived tuberculin-sensitivity. This can be overcome by frequent periodic re-vaccination, which calls, however, for close follow-up of the vaccinated. This method of vaccination has been little studied in Europe, and it is high time that it was tested in this country. If repeated vaccination by mouth proved successful, how simple the whole procedure would become. With the multiple-

puncture tuberculin test, we could eliminate all syringes, the rigid time schedule in the B.C.G. programme, and the need for doctors to do the testing and vaccinating.

From Brazil, de Assis (1953) reports that over 3 million persons have now been vaccinated by the oral technique. 100 mg. is given during the first week of life, followed by monthly doses of 100 mg. for three to six months. He claims that with this method a 100% conversion-rate is obtained and complications are rare; and that oral vaccination without tuberculin testing is harmless.

Sayé (1953) administers B.C.G. in a dose of 100–150 mg. and repeats the dose every six months in non-contacts. In contacts he re-vaccinates for six months with the same dose every 8, 15, 28, or 90 days, according to the degree of exposure to infection.

There is no reason to doubt that oral administration has given excellent results in Spain and South America, but there is evidence that the strain of B.C.G. used in those countries is different from that used in northern European countries.

Scarification

Scarification will give about 85% conversions. It is difficult to obtain a higher rate, although the French claim 95%. The method is slow, and a dressing has to be applied. Complications are infrequent, but tuberculin-sensitivity develops more slowly than with the intradermal technique. The results vary greatly; low conversion-rates are due to using too small quantities of vaccine or to too superficial scarification. The method has the disadvantage that the amount of B.C.G. introduced is unknown.

Multiple Puncture

Rosenthal (1937) and Birkhaug (1947) have advocated vaccination by multiple puncture. The method has the advantage of being particularly free from complications and local ulceration, but Geser (1954) has shown that the degree of tuberculin-sensitivity obtained is less than by the intradermal method. An advantage of this method is the absence of syringes and needles and the uniformity of operation. The conversion-rate is satisfactory.

The method has not been used much in this country, partly because a special strength of B.C.G. is required (not less than 20 mg. per ml.) and partly because of the expense and difficulty of obtaining the apparatus. There is also the drawback of not knowing the amount of B.C.G. introduced, but that is not of great consequence in routine work if the conversion-rate is satisfactory and there are no comp'ications. The method deserves further investigation because of its simplicity and uniformity of operation.

Intradermal Injection

An intradermal injection is not difficult to give, provided needles are sharp, syringes are good, and the subject keeps still. The first two conditions can be satisfied; but children are liable to wriggle and infants can be difficult. It is important that the injection is given intradermally. Gaisford and Griffiths (1951) have shown that it is unnecessary to give a double dose to infants, and in Cardiff we have confirmed the experience of O'Meara and Price (1953) that the complication-rate is greatly reduced by dividing the dose of B.C.G. vaccine into two injections, each of 0·05 ml., into one arm. In Cardiff we have been impressed by this technique and are adopting it for all children under the age of five years.

It is somewhat unfortunate that there are four methods of vaccination, each requiring its own particular strength of vaccine. There is little doubt that the incidence of complications and the degree of tuberculin-sensitivity are related to the manner by which the B.C.G. is given. In Great Britain we favour the intradermal technique, but if the multiple-puncture method could be made to produce more permanent tuberculin-sensitivity it would be the method of choice since it is more uniformly performed than any other. The disadvantage is that the dose of B.C.G. is unknown; but if the apparatus is carefully used it is doubtful whether the variation is much greater than by the intradermal technique.

FUTURE TRENDS

I have mentioned these methods because I feel that in the future there must be considerable simplification of the B.C.G. programme. In the years to come tuberculous infection will become very much less frequent in all age-groups. The herd immunity will consequently fall. Tuberculosis may then become an acute progressive disease, particularly in young children and adolescents. But there will always be a hard core of chronic endogenous infection lesions that can infect the tuberculin-negative majority. For these B.C.G. will be necessary to raise the herd immunity. The freeze-dried vaccine will ultimately be the type generally used. In time, for all routine vaccination, the multiple-puncture tuberculin test will, I think, replace the intradermal one; but ultimately a tuberculin test will not be required at all. Multiple-puncture vaccination will be favoured. Post-vaccination tuberculin testing will, I think, be restricted to those who fail to give a local reaction of a certain degree of intensity. It is not at all improbable that newborns and infants will in the future be vaccinated by the oral technique, as recommended by Sayé (1953). These changes will, I think, remove some of the present disadvantages of B.C.G. vaccination.

Complications

The most serious complication of vaccination is disseminated tuberculosis. In two published cases (Meyer 1954, Thrap-Meyer 1954) death has followed B.C.G. vaccination, and a third death, in Sweden, has been mentioned. There has been no explanation of these unfortunate results, except that the patients had no inherent resistance to the infection. This is not the complete answer; one of the patients was not healthy, since he had had an increased erythrocyte-sedimentation rate for years before vaccination. Further information is needed on the factors causing this failure of the defence mechanism of the body.

Fortunately, serious complications are extremely rare. Minor complications are commoner than is desirable and can be troublesome for many months. Many factors are associated with their development, among which I would mention: (*a*) the inherent resistance of the individual, (*b*) the potency of the vaccine, (*c*) the magnitude of the dose, and (*d*) faulty technique.

From a study of reports on complications in 250 cases sent to the Ministry of Health up to the end of 1953, certain impressions have been gained. The series has no statistical value since the total number of complications and of vaccinations is not known. The majority of the reported complications arose in 1951 and 1952; the reported number fell considerably in 1953. This, of course, may be because of a decline in interest in reporting, but I prefer to believe that improvement in technique had an influence. Complications from the same batch of vaccine were rarely reported from two or more places. This means that generally the vaccine is satisfactory. Certain isolated ampoules may have varied considerably in strength from the majority in the batch; but this was difficult to prove.

The *age-distribution* of the 250 cases with complications was as follows: up to one month, 157; two to six months, 22; seven to twelve months, 14; one to two years, 15; three to five years, 14; six to ten years, 7; eleven to fifteen years, 8; sixteen to twenty years, 8; twenty-one to twenty-five years, 5. Thus complications were commoner in the younger age-groups. This may be due to faulty technique, but more probably it is due to low resistance of the tissues.

HEALING-TIME OF SINUSES IN 166 CASES ACCORDING TO AGE

Age (yr.)	No. of cases	Healing-time (mos.)								
		–2	–3	–4	–5	–6	–7	–9	–12	Over 12
0–1/12	116	1	9	14	7	18	4	24	31	8
2/12–6/12	22	..	2	2	..	1	3	9	5	..
7/12–11/12	10	..	1	2	2	..	1	..	2	2
1–2	5	..	..	1	..	..	..	1	3	..
3–5	5	..	..	..	1	1	..	..	2	1
6–10	6	..	1	1	..	1	1	1	..	1
11–15	2	..	1	..	..	..	..	1	..	..

Lymph-nodes were involved as follows: inguinal, 94; axillary, 109; cervical, 15; hilar, 8; multiple, 2; site not recorded, 3. Calcification was recorded in 20 cases.

Other complications were as follows: lung infiltration, 4; phlyctenular conjunctivitis, 3; erythema nodosum, 2; late lymphadenitis, 2; implantation ulcer, 2; joint pains, 3; pyrexia, 4; skin rash, 2; lupus, 1.

Treatment.—Where this was recorded lymph-node involvement was as follows: local streptomycin injections, 32; intramuscular streptomycin, 4; local *p*-aminosalicylic acid (P.A.S.), 5; oral P.A.S., 14; aspiration only, 22; ultraviolet light, 12; excision, 10; incision and curetting, 3; proflavine, 1; penicillin, 5; silver nitrate, 2; dry dressing, 24.

The *healing-times* in months in 166 cases, with sinuses, were as follows: up to two, 1; three to four, 34; five to six, 31; seven to eight, 37; nine to ten, 31; eleven to twelve, 20; thirteen to fourteen, 0; fifteen to sixteen, 9; seventeen to eighteen, 0; over eighteen, 3. The healing-times according to the age of the patients are shown in the accompanying table.

In 49 cases *acid-fast bacilli* were sought, and in 35 found. In 14 of these 35 cases the bacilli were typed and were found to have the character of B.C.G.

These figures show a high preponderance of complications in infants, long persistence of sinuses in some cases, and diversity in treatment.

Conversion and Reversion

With the improved technique it is usual for at least 98% of those vaccinated to show tuberculin allergy six to eight weeks after vaccination. Over 80% are allergic three weeks after injection with fresh B.C.G. but post-vaccination sensitivity is not maximal until eight weeks have elapsed. Frew (1954) has shown that some degree of tuberculin-sensitivity is present before the local B.C.G. lesion develops, which would mean that the development of the B.C.G. lesion at the site of inoculation is due to the fixation of the bacillus by the sensitivity that is developing. With freeze-dried vaccine, it may require three months to reach maximum allergy. These periods are important since it is desirable not to return a person with no, or low, tuberculin-sensitivity to an infectious environment. If the vaccinated persons are exposed to natural infection, the sensitivity conferred by B.C.G. will be augmented by that following subsequent infections. In a sparsely populated area or a country with a low infection-rate, this may not occur. The person will then have to rely for protection on the permanency of the B.C.G. allergy. It is therefore important to know how long it lasts. There are records of its disappearing as early as six months and lasting as long as seven years.

In the past two years we have been finding in Cardiff that the reversion-rate after the first year was 10% for the fresh vaccine, and 15% for the dried; at the end of the second year the corresponding figures were 20% and 25%. We always re-tested on the left arm, where the previous tuberculin test had been done. Because of the high reversion-rate, Dr. Phyllis Bowen began this year to re-test on both arms, and she found that a year after vaccination some vaccinated children were negative on the left arm and positive on the right arm. Now we are re-testing always on the opposite arm to the one on which previous tuberculin-testing was done, and our reversion-rate has fallen to about 2%. The observation is important; for although it is well known that a local desensitisation to tuberculoprotein develops for a short time at the site of tuberculin testing, I do not think it is generally realised that this desensitisation extends to two or three inches from the site and can persist for at least twelve months.

The lesson is: always re-test on the arm that was not previously used for tuberculin testing. Unfortunately, we have only two arms, so I am at a loss to know what we do in a three or four year follow-up. Possibly we shall have to go to the lower limb, or possibly sensitivity is regained after two years. Certainly more work is needed on this interesting phenomenon.

Records

It may be wrong to mention the need for keeping records as a disadvantage of B.C.G. vaccination, but it is most important that records be kept, particularly in regard to young children. Without records the tuberculin-sensitivity resulting from B.C.G. vaccination may be ascribed to virulent bacilli and lead to a diagnosis of active tuberculosis. This has already occurred, and will occur again if the physician examining the patient is not informed of the vaccination. Furthermore, for administrative purposes it is necessary to know the number of those vaccinated, and epidemiologically it is useful to know the number of vaccinated persons who develop tuberculosis. It is therefore essential to keep good records.

In B.C.G. work record-keeping falls into three categories.

1. There are the official statistics required by the Ministry of Health. The minimum required are those needed to determine the number vaccinated. It would be an advantage if it were always made clear that a particular child had been vaccinated, and some local authorities have instituted a vaccination certificate. But at present some physicians are vaccinating without informing the chest physician or the medical officer of health; this is unfortunate and should be rectified as soon as possible.

2. There are the records required by special investigations established for a specific purpose by an official body and backed by funds and personnel.

3. There are the records required for personal surveys organised by one or more persons to throw light on some particular aspect of B.C.G. vaccination.

In all these records it is essential to maintain simplicity and refrain from investigating too many aspects of the problem at once. It is essential that the vaccination programme in any area should not expand faster than the recording system can deal with the returns.

A simple record card, well kept, is better than a complicated one kept badly. Much will depend on the nature of the investigation, but perhaps the controlling factor is the number and training of the staff who will be called upon to keep the records.

Finale

Perhaps the greatest disadvantage associated with B.C.G. vaccination is the unwarranted confidence that it has inspired in laymen in many countries: many believe that it is a complete protection against tuberculosis. This can easily lead to the neglect of essential measures for eliminating the predisposing causes of tuberculosis and the spread of infection.

B.C.G. is an important pillar in the structure of our preventive services, but it cannot stand alone.

I am grateful to Dr. Phyllis Bowen, of the B.C.G. Clinic, Cardiff, for permission to describe her unpublished work.

REFERENCES

Birkhaug, K. (1947) *Amer. J. clin. Path.* **17**, 751.
— Darricarrière, R. (1953) *Amer. Rev. Tuberc.* **68**, 96.
de Assis, A. (1953) *Hoja tisiol.* **13**, 325.
Dunlevy, M. (1954) *Med. Offr.* **92**, 53.
Edwards, L. B., Tolderlund, K. (1952) *Bull. World Hlth Org.* **5**, 245.

References continued overleaf

URINARY EXCRETION OF ŒSTROGENS DURING THE MENSTRUAL CYCLE

J. B. BROWN
M.Sc. N.Z., Ph.D. Edin.

From the Clinical Endocrinology Research Unit (Medical Research Council), University of Edinburgh

MANY workers have measured the excretion of œstrogens in the urine during different phases of the menstrual cycle. The most constant finding has been two peaks of excretion, one about the time of ovulation and the other during the luteal phase. However, most of the results have been obtained using bio-assay methods and have been expressed in terms of animal units of total œstrogenic activity (see Gustavson et al. 1938, Pedersen-Bjergaard and Tønnesen 1948). Since at least three œstrogens (œstriol, œstrone, and œstradiol-17β) have been found in human urine, and it is erroneous to measure biologically such a mixture of substances with different activities, the results obtained have little quantitative significance. Smith et al. (1938) and Smith and Smith (1952) obtained more reliable results by separating the œstrogens, before bio-assay, into œstriol, œstrone, and œstradiol fractions, and expressing their results in terms of the weights of pure crystalline œstrogens.

Jayle and Crèpy (1952) used the Kober colour reaction to measure total œstrogens and reported the results obtained throughout two menstrual cycles. But these figures, too, have limited quantitative meaning, since œstriol, œstrone, and œstradiol-17β all give different colour intensities in the Kober reaction. Engel (1950), Engel et al. (1950), and Migeon (1953) attempted to measure the urinary œstrogens excreted during the menstrual cycle by using counter-current distribution to separate and identify the individual œstrogens and fluorimetry to measure them. However, fluorescing contaminants interfered considerably with the measurement of œstrogens, and the main significance of the work was that Migeon obtained good evidence that œstriol, œstrone, and œstradiol are all present in pooled menstrual-cycle urine.

More recently a convenient, accurate, and apparently specific chemical method for separately estimating œstriol, œstrone, and œstradiol-17β in human urine has been developed (Brown 1955a and b), and it is now possible

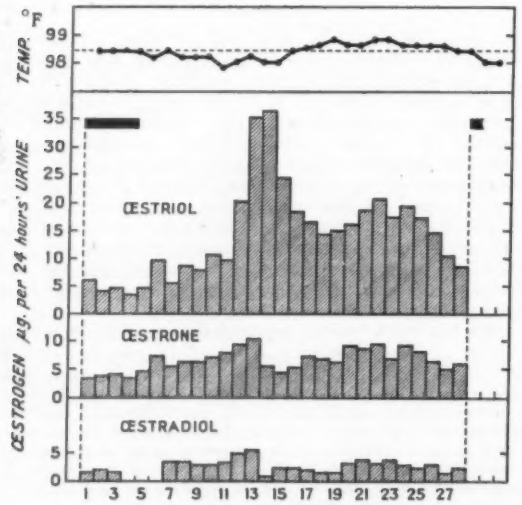


Fig. 1—Subject 1 ; aged 36 ; para.-3. This figure and figs. 2–8 show the amounts of œstriol, œstrone, and œstradiol excreted per 24 hours, and also the variations in basal temperature.
▬ = Menstrual period.

ŒSTROGEN LEVELS FOUND AT VARIOUS TIMES DURING THE MENSTRUAL CYCLE
(Collected from ten cycles)

Time in cycle	Œstrogens excreted (μg. per 24 hours)					
	Average			Range		
	Œst-riol	Œst-rone	Œst-radiol	Œst-riol	Œst-rone	Œst-radiol
Onset of menstruation	6	5	2	0–15	4–7	0–3
Ovulation peak ..	27	20	9	13–54	11–31	4–14
Luteal maximum ..	22	14	7	8–72	10–23	4–10

More recently a convenient, accurate, and apparently specific chemical method for separately estimating œstriol, œstrone, and œstradiol-17β in human urine has been developed (Brown 1955a and b), and it is now possible

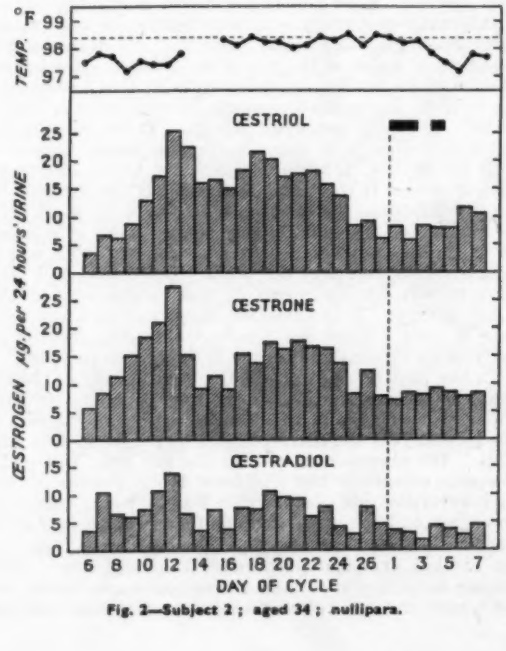


Fig. 2—Subject 2 ; aged 34 ; nullipara.

PROF. HEAF : REFERENCES—*continued*

Fisher, M. (1954) *Med. Offr*, **92**, 187.
Foley, H., Parrot, L. (1954) See *Bull. Hyg., Lond.* **29**, 602.
Frew, H. (1954) Personal communication.
Gaisford, W., Griffiths, M. (1951) *Brit. med. J.* ii, 702.
Gedde-Dahl, T. (1952) *Amer. J. Hyg.* **56**, 139.
Gernez-Rieux, Ch. Breton, Houcke, Méreau, and Sevin (1947) *Rev. Tuberc., Paris*, **11**, 727.
Geser, A. (1954) *Dis. Chest*, **26**, 62.
Hertzberg, G. (1947) *Tubercle*, **28**, 1.
— (1948) Achievements of B.C.G. Vaccination. Oslo.
— (1949) *Acta tuberc. scand.* **23**, 338.
International Tuberculosis Campaign (1952) Final report on work. July 1, 1948, to June 30, 1951. Copenhagen.
Irvine, K. N. (1949) B.C.G. Vaccination in Theory and Practice. Oxford.
— (1954) B.C.G. and Vole Vaccination. London.
MacDougall, I. A., Mikhail, J. R., Tattersall, W. H. (1953) *Brit. med. J.* i, 64.
McKinstry, R. N., Darling, A. S. (1953) *Publ. Hlth, Lond.* **66**, 191.
Meyer, J. (1954) *Amer. Rev. Tuberc.* **70**, 402.
Ministry of Health (1950) Memorandum 322/B.C.G./revised.
O'Meara, R. A. Q., Price, D. (1953) Personal communication.
Oppers, V. M. (1952) *Rev. Tuberc., Paris*, **6**, 992.
Palmer, C. E. (1952) *Lancet*, i, 935.
Refvem, O. (1954) *Acta tuberc. scand.* **149**, suppl. 294, p. 121.
Research Committee of Tuberculosis, Japan (1954) Recent Investigations on B.C.G. Vaccine.
Rosenthal, S. R. (1937) *Amer. Rev. Tuberc.* **35**, 678.
St. Ultan's Hospital, Dublin (1953) Annual report, 1952.
Sayé, L. (1953) *Acta phthisiol.* no. 9.
Seibert, F., DuFour, E. H. (1954) *Amer. Rev. Tuberc.* **69**, 585.
Thrap-Meyer, H. (1954) *Acta tuberculosea scandinavica*, **29**, 173–192.
Ustvedt, H. J. (1950) *Bull. World Hlth Org.* **2**, 501 ; *Tubercle*, **31**, 261.

to make more reliable and detailed measurements of their excretion. I report here the results of applying this method to a study of the urinary excretion of œstrogens during a number of menstrual cycles of apparently normal women. This was a necessary preliminary to the study of abnormal conditions. A preliminary communication on some of these results has already been presented (Brown 1955a).

Method

Complete 24-hour urine specimens were collected daily through the whole menstrual cycle of eight apparently normal women whose ages ranged from 17 to 40 years. In two cases (subjects 7 and 8) two whole menstrual cycles were studied. The amounts of œstriol, œstrone, and œstradiol-17β in each 24-hour urine specimen were determined by the chemical method described by Brown (1955b). Morning basal temperatures were taken orally throughout each cycle to correlate the œstrogen levels with times of expected ovulation.

Results

The results are shown in figs. 1 to 8 and in the table. In both cases where two cycles were studied, the

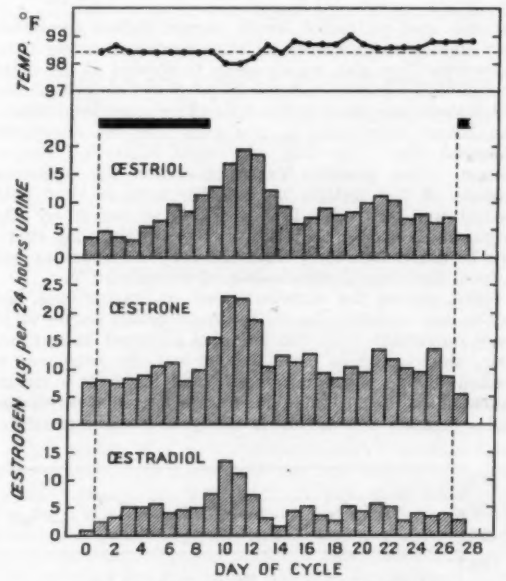


Fig. 3—Subject 3 ; aged 40 ; nullipara.

results obtained during the second cycle of each individual were almost identical with those obtained during the first cycle. Consequently only one cycle from each subject is included in the figures.

A number of features common to all the cycles is apparent. The amounts of the three œstrogens excreted generally rise and fall together. The œstradiol levels are almost always lower than the corresponding œstrone levels, the ratio between the two being approximately constant at 1 : 2. There is no such constant ratio between the œstriol and œstrone levels, for the œstriol level may be equal to or greater than the corresponding œstrone level. The amounts excreted are lowest during the first week of the cycle and begin to rise at about the 7th day to reach a well-defined maximum (the " ovulation peak ") at about the 13th day—or, more accurately, 14 days before the onset of the next menstrual period. This maximum occurs about the time of the temperature rise and is presumably related to ovulation. The peak is followed by a sudden decrease in œstrogen excretion.

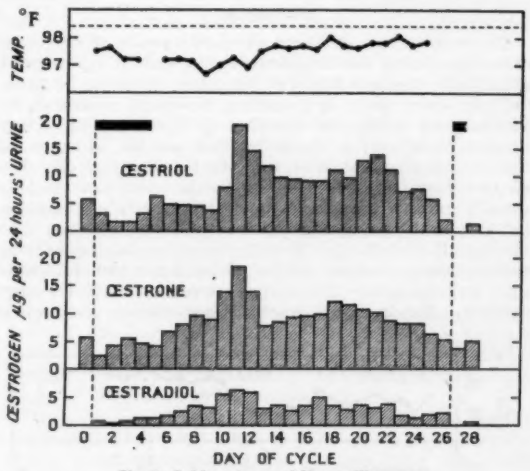


Fig. 4—Subject 4 ; aged 28 ; nullipara.

During this phase of the cycle the changes in the œstrone and œstradiol levels parallel one another, but the changes in the œstriol levels tend to lag about 24 hours behind the other two. This lag phenomenon is sometimes masked by the 24-hour interval over which the urine specimen is collected, but even so is clearly seen at the time of the ovulation peak and subsequent drop. After suddenly decreasing, the œstrogen levels tend to increase again to a second maximum (the "luteal maximum"), which occurs on about the 21st day, and then decrease before the onset of menstruation. During the luteal phase the œstriol lag is not apparent. The lowest levels are often reached several days after the onset of menstruation.

While the pattern of œstrogen excretion is constant, the actual amounts found in the urine of different subjects vary over a considerable range. Those found at the onset of menstruation, at the ovulation peak, and at the luteal maximum are summarised in the table.

No abnormal symptoms were recorded by any subject during the cycle studied. Furthermore, three subjects (4, 7, and 8), two of whom (7 and 8) were still collecting urine for assay, became pregnant shortly afterwards ; and a parous subject, whose œstrogen excretion was similar to that of subject 6, became pregnant during the cycle being studied. There is therefore no evidence of correlation between the relative or absolute amounts of œstrogens excreted and the subjective symptoms, parity, or fertility of the woman. On the other hand it is interesting to note that the youngest subject (5) excreted the lowest amounts of œstrogens.

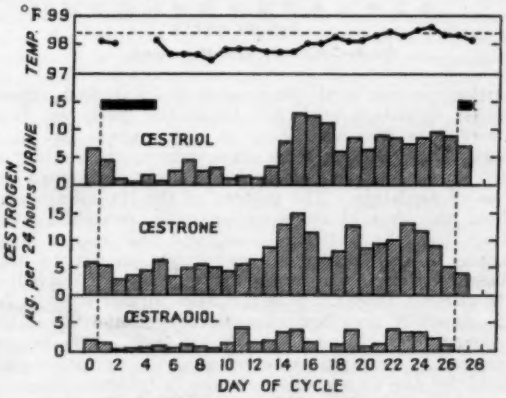


Fig. 5—Subject 5 ; aged 17 ; nullipara.

Discussion

The results reported here show two peaks of œstrogen excretion during the menstrual cycle, and in this respect are similar to those reported by other workers. Quantitatively, too, they are similar to those reported by Smith et al. (1938) and Smith and Smith (1952). They present, however, a more detailed picture of some of the events which occur during the menstrual cycle. We see, for instance, that the rise to the ovulation peak is usually gradual; and the most satisfactory explanation for this is an increasing production (and secretion into the blood) of œstrogen from a rapidly enlarging follicle, rather than a sudden release of œstrogen-rich follicular fluid at ovulation. At the peak itself both factors may operate. The highly characteristic ovulation peak was a

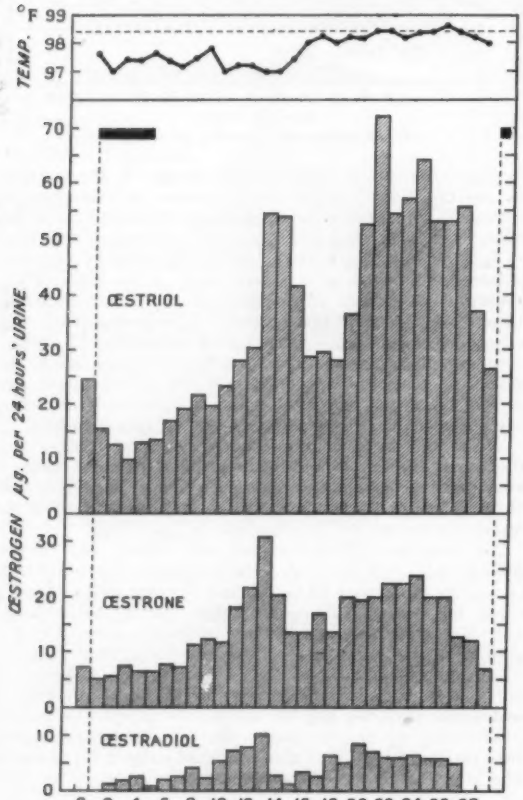


Fig. 6—Subject 6; aged 32; para-2.

constant finding in all the normal cycles studied. Since neither ovulation peak nor luteal rise have yet been observed in this laboratory in any woman having a uterus and suffering from amenorrhœa, the finding of such a peak may be good evidence of the occurrence and time of ovulation. The pattern of the three œstrogens about the time of ovulation—namely, œstradiol levels about half the œstrone levels, and the œstriol levels lagging a day behind—is essentially similar to that observed after the intramuscular injection of œstradiol-17β (Brown 1955a). This furnishes further support for the generally accepted view that œstradiol-17β is the primary ovarian hormone at this time. The sudden decrease in œstrogen excretion after the ovulation peak could be due to a sudden change in follicular function caused by rupture at ovulation. If this is so, the drop in

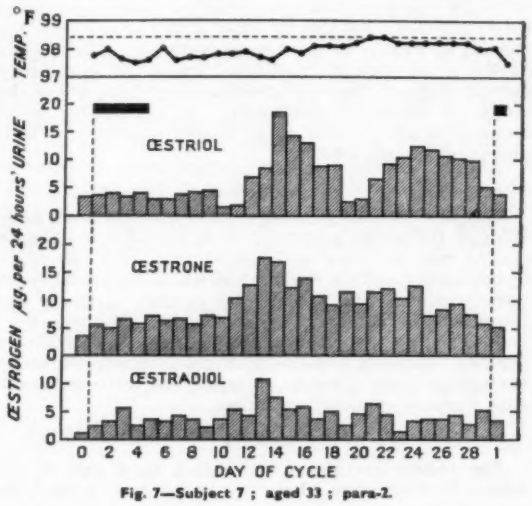


Fig. 7—Subject 7; aged 33; para-2.

œstrone and œstradiol levels should follow ovulation very closely and indicate its time more accurately than the temperature rise, which seems to depend on the more gradual and variable increase in progesterone production which also takes place at this time (Davis and Fugo 1948). The luteal maximum is probably due to œstrogens produced by a growing and then regressing corpus luteum. One possible explanation for the apparent absence of the œstriol lag at this time is that both œstriol and œstradiol-17β may be produced by the corpus luteum, and that the urinary œstriol may therefore be derived directly from the corpus luteum as well as from the normal metabolism of œstradiol-17β.

Since, unless the circumstances are exceptional, the day-to-day variation in œstrogen excretion seems to be more important than the amounts excreted at any one time, single random estimates of urinary œstrogens in women during reproductive life will have little significance unless the specimen has been collected at a relevant and accurately known time in the cycle. Serial estimations

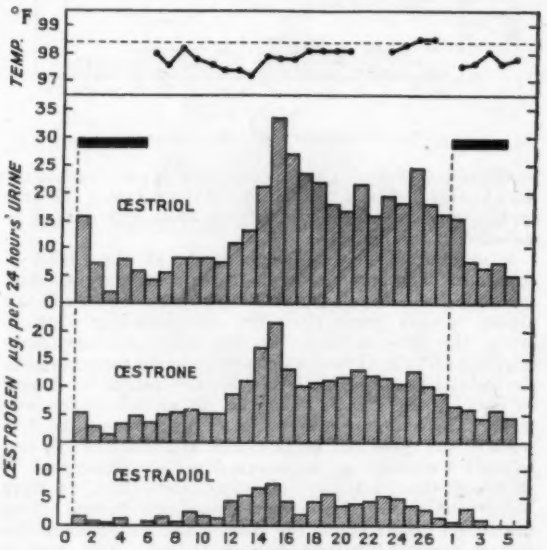


Fig. 1—Subject 8; aged 27, para-2.

appear to be necessary before any accurate assessment of ovarian function can be made employing these methods.

Summary

Results obtained using a new chemical method for estimating the urinary excretion of œstriol, œstrone, and œstradiol-17β during 10 normal menstrual cycles in women are recorded and discussed.

I wish to thank Prof. G. F. Marrian, F.R.S., and Prof. R. J. Kellar, for their interest in this work. I am also grateful to the female members of the staff and wives of colleagues who contributed the specimens, and to Mr. H. A. F. Blair and Miss Janet Mackie for their skilled technical assistance.

REFERENCES

Brown, J. B. (1955a) *Mem. Soc. Endocrin.* **3** (in the press).
— (1955b) *Biochem. J.* (in the press).
Davis, E. D., Fugo, N. W. (1948) *J. clin. Endocrin.* **8**, 550.
Engel, L. L. (1950) *Recent Progr. Hormone Res.* **5**, 335.
— Slaunwhite, W. R., Carter, P., Nathanson, I. T. (1950) *J. biol. Chem.* **185**, 255.
Gustavson, R. G., Mason, L. W., Hays, E. E., Wood, T. R., D'Amour, F. E. (1938) *Amer. J. Obstet. Gynec.* **35**, 115.
Jayle, M. F., Crèpy, O. (1952) *Ann. Biol. Clinique*, **10**, 44.
Migeon, C. J. (1953) *J. clin. Endocrin. & Metab.* **6**, 674.
Pedersen-Bjergaard, K., Tønnesen, M. (1948) *Acta endocr., Copenhagen*, **1**, 38.
Smith, G. V. S., Smith, O. W., Pincus, G. (1938) *Amer. J. Physiol.* **121**, 98.
Smith, O. W., Smith, G. V. S. (1952) *Recent Progr. Hormone Res.* **7**, 209.

EFFECTIVE CIRCULATION OF THE UTERINE WALL IN LATE PREGNANCY

MEASURED WITH ^{24}NaCl

NORMAN MORRIS
M.D. Lond., M.R.C.O.G.
FIRST ASSISTANT, OBSTETRIC UNIT

S. B. OSBORN
B.Sc. Lond., A.Inst.P.
PHYSICIST

H. PAYLING WRIGHT
B.Sc., Ph.D. Lond., L.M.S.S.A.
RESEARCH ASSISTANT, OBSTETRIC UNIT

UNIVERSITY COLLEGE HOSPITAL AND MEDICAL SCHOOL, LONDON

THE thesis that pre-eclampsia might be associated with placental ischæmia led Browne and Veall (1953) to attempt the measurement of placental blood-flow. Using an isotope technique they were able to locate the placenta in women during the last trimester of pregnancy. In patients in whom the placenta was placed anteriorly they injected isotonic saline solution containing ^{24}NaCl through the uterine wall into the placenta. Browne and Veall showed that the rate at which the injected material was removed from the placental site varied considerably; in normotensive women the removal was extremely rapid, whereas in patients with raised blood-pressure, either from pre-eclampsia or from essential hypertension, it was notably delayed.

This diminished clearance-rate might result from inadequate development of, or from pathological changes within, the placenta itself or from a reduction of the blood-supply from the uterine wall. To elucidate this question it seemed of value to attempt comparative measurements of uterine (as opposed to placental) blood-flow in normal and in pre-eclamptic pregnancies.

Method

In the present series of observations 0·3–0·4 ml. of isotonic saline solution containing ^{24}NaCl with an activity of 5–10 μC was injected directly into the uterine wall. As a standard procedure the area chosen was the lower left quadrant, about 4 cm. below and to the side of the umbilicus. The abdominal wall and peritoneum were locally infiltrated with 1% lignocaine hydrochloride ('Xylocaine') and the injection needle was introduced through the anæsthetised area. It was possible to ascertain when the needle had been inserted into the uterine wall because the abdominal muscles moved relatively more than the uterus when the woman took a deep breath; this caused the needle head to be deflected sharply downwards. When the needle was properly positioned, neither blood nor liquor amnii was withdrawn by suction on the syringe.

In every case the nature and main features of the investigation were explained to the patient before the examination was started. Their most frequent reaction was one of interest and willingness to coöperate. The procedure caused them very little inconvenience. They felt only the introduction of the local anæsthetic through the skin and later a very transient, sharp, and deeply located prick when the uterine peritoneum was pierced. Many of them said they felt nothing.

The injection of the radio-sodium was made as rapidly as possible. Care was taken to prevent leakage along the needle track by emptying the syringe while the needle was fully inserted; the skin was wiped free from blood and saline solution after the needle had been withdrawn. A screened end-window γ-ray Geiger-Müller counter was immediately placed over the site of the injection and, to maintain its position relatively constant, fixed to the skin with adhesive tape. During the period of observation the counting-rates over the injection site were recorded at $^1/_2$-minute intervals on a counting-rate meter. The results were expressed as the "time to half-value" after a correction had been made for the rising background caused by an increasing amount of ^{24}Na appearing in the blood-stream after its removal from the injection pool. This corrected counting-rate $(c - b)$ was calculated for each observed counting-rate (c) from the following formula:

$$c - b = c - \frac{b_2(\mathrm{I} - b_1) - c(b_2 - b_1)}{\mathrm{I} - b_2}$$

where I = initial count per min., b = corrected background count per min., b_1 = initial background count per min., b_2 = final background count per min., and c = observed counting-rate to be corrected for background. The final background (b_2) was obtained by observing the counting-rate over the contralateral area of the uterus at the end of the experiment. For this purpose it was assumed that this count represented the radioactivity in a cone of tissue corresponding to that containing the injection site but free from radiations arising from the residual pool of the radioactive material.

This technique was essentially similar to that described by Kety (1948, 1949) to measure the clearance-rate of locally injected radioactive sodium from the site of injection. Though such clearance depends on many interacting factors (McGirr 1952) it is essentially based upon the postulate that the rate of removal of a diffusable substance is proportional to, and offers a measurement of, local tissue circulation. It must, however, be emphasised that the technique measures the *effectiveness* of local tissue circulation rather than the absolute blood-flow in the area.

In the present study certain factors which influence the clearance-rate of the injected sodium may be considered to be uniform. Thus, the temperature of the uterine wall may be assumed to be independent of environmental conditions; since the patient is confined to bed, moreover, the restricted skeletal muscle activity which is possible can have little influence on the uterine blood-flow. Finally, the uniformity of texture of the unstriped musculature of this organ renders it improbable that spurious results will arise from leakage of the tracer substance from the site of injection along fascial layers.

On the other hand, certain uncontrollable factors may considerably influence the clearance-rate of $^{24}NaCl$ from the wall of the uterus. Of these the chief are (1) the effects of rhythmic uterine contractions, (2) the tonicity of the musculature, (3) the proximity of the injection site to the placenta, and (4) the depth of the injection from the peritoneal surface of the uterine wall. In this preliminary study no attempt was made to assess the influence of these factors on the clearance-rate of the injected material. Repeat observations on individual patients, however, were satisfactorily comparable. In 9 instances where repeated measurements were made the differences between the observed clearance times were never greater than 0·7 minute. There was, therefore, no indication that the unknown variables were interfering with the reliability of the observed results.

Material

Observations on the clearance-rate of radio-sodium from uterine muscle were made on 48 pregnant women. Of these, 20 were normal uncomplicated cases between the 34th week of pregnancy and term. Half of these women were primigravidæ, 6 had had one child, and only 4 had had several pregnancies. The criteria of normality were their general obstetrical condition coupled with normotension—i.e., a diastolic pressure consistently below 85 mm. Hg.

A second and smaller group of 10 cases were classed as mild pre-eclampsia. These women had been admitted to hospital because of a sudden rise in blood-pressure with or without albuminuria. The diastolic pressure of this group was 85–95 mm. Hg. Observations were again made between the 34th week of pregnancy and term. In this group 6 women were primigravidæ, 3 had had one child, and 1 only had had several pregnancies.

We examined a small group of 8 cases of severe pre-eclampsia. In these the diastolic blood-pressure was 95–115 mm. Hg, and all these women showed typical signs of pre-eclampsia. The period of gestation in these women was somewhat shorter than in the other two groups; the observations were made between the 30th and the 39th weeks of pregnancy. Of these 8 women, 4 were primigravidæ, 1 had had one pregnancy, and 3 had had several pregnancies.

Finally, we examined a series of twin conceptions. At the time of investigation the infants were viable and apparently normal, though in 1 case the fœtuses died before delivery. These women were observed between the 32nd week of gestation and term. Six were primigravidæ, 3 had had one pregnancy, and only 1 had had several pregnancies.

Results

The average clearance-rates of $^{24}NaCl$ from the uterine muscle, together with the standard errors of these means, are set out in the accompanying table for the four groups of women examined.

AVERAGE CLEARANCE-RATES

Type of pregnancy	No. of observations	Time to half-value (min.)
Normal	20	4·1 ±0·354
Mild pre-eclamptic	10	7·7 ±0·523
Severe pre-eclamptic	8	15·3 ±2·854
Twin conception	10	6·6 ±1·054

It is evident from these figures that the clearance-rate of the injected diffusable ion is greatly reduced in pre-eclampsia. In the mild cases, where the diastolic blood-pressure had never risen above 95 mm. Hg, the average clearance time was about twice as long as in the normal controls. In the severe cases this prolongation of clearance time was even greater, the average being almost four times that of the normal. Examined statistically by the Fisher method for small samples the groups exhibited strongly significant differences. Thus P was less than 0·01 both between the normal group and the mild pre-eclamptics and also between the mild and severe cases.

Similarly there was a significant difference between the normal single pregnancies and the twin gestations, P being less than 0·01, which implies a chance of more than 100 to 1 that the means of the groups are different.

Discussion

From a consideration of the functions of the uterine circulation two salient points emerge. Firstly, it must supply, through the placenta, the metabolic needs of the growing fœtus, and this demand probably has priority over others. Secondly, it must also maintain the metabolic integrity of the trophoblast. It is possible that, in certain circumstances, the uterine circulation may be just sufficient for the former but inadequate for the latter.

From the study of severe early pre-eclampsia two constant findings appear: (1) its onset is generally extremely sudden and the hypertension considerable; and (2) the placenta is almost always very small, infarcted, seemingly underdeveloped, and of poor function. Clearly the trophoblast, by reason of its unique versatility of function and activity, has a high oxygen requirement. Many of the biochemical changes known to take place in pre-eclampsia, such as the diminished progesterone and œstrogen activity (Smith and Smith 1948), the disturbance in adrenocortical secretion (Venning et al. 1954), and the production of histaminase (Ahlmark 1944), imply an impairment in the trophoblastic metabolism. These findings suggest that the pre-eclamptic syndrome becomes manifest at a time when the demands of the fœtus, together with those of the trophoblast, exceed the supply that can be maintained by the maternal circulation, and it is possible that trophoblastic anoxæmia may prove to be an important factor or even the "trigger mechanism" which determines the onset of pre-eclampsia. Although the fœtus in these cases may survive in utero for a few weeks, its development is always retarded and it remains grossly undersized. In such cases the maternal blood-flow may have been inadequate to fulfil its dual function to the fœtus and to the trophoblast.

The hypothesis that a reduction in blood-supply to the uterus is a factor in the onset of pre-eclampsia has received considerable support (Page 1939, 1948, Beker 1946, 1948, Bastiaanse and Mastboom 1949). These workers have emphasised that the incidence of pre-eclampsia is particularly high in twin pregnancy, hydramnios, essential benign hypertension, and hydatidiform mole. In each of these conditions there are circumstances which could lead to a relative failure of the effective circulation and consequently to trophoblastic anoxæmia.

From our results it appears certain that there is a significant reduction in the effective uterine blood-flow associated with pre-eclampsia which develops in a previously normotensive woman. This reduction is probably one of the main factors responsible for the decreased placental flow described by Browne and Veall (1953). The reduction in flow appears to be directly related to the increase in diastolic blood-pressure, and it is interesting that, from our observations, an increase of 10 mm. Hg is associated with a clearance-rate which is, at best, only half that of the normal, whereas in the more severe cases the effective blood-flow is only a small fraction of the normal.

We have had no opportunity to study the $^{24}NaCl$ clearance-rate before and after the onset of pre-eclampsia. Nevertheless the results in our small series of uncomplicated twin pregnancies, which are recognised to be particularly liable to develop pre-eclampsia, suggest that

the uterine blood-flow is not so adequate in them as in the normal. This is also true of our scattered observations on cases with hydramnios and preconceptional hypertension. All these show clearance-rates which fall at the upper limit of normality and could therefore be considered to be on the verge of pre-eclampsia.

Rest in bed is a well-established therapeutic measure in the treatment of pre-eclampsia and often brings about a significant fall in blood-pressure. In recent years severe cases have also been treated with various hypotensive drugs, such as hexamethonium (Morris 1953), hydrazinophthalazine (Assali and Suyemoto 1952), and extracts of veratrum (Meilman 1953, Käser 1954) and of rauwolfia. There has been some debate about the value of such treatment, and it has been suggested that the induced hypotension may perhaps only be masking, and not alleviating, the underlying pathological changes. During the course of the present study it has been possible to make observations on 5 patients with severe pre-eclampsia both initially and later, when effective hypotensive treatment had been initiated. In these women the initial uterine clearance-rate was extremely slow, but after therapy with a hypotensive drug there was a twofold or threefold increase, which coincided with the reduction of the blood-pressure.

These observations appear to confirm that the use of such drugs is of demonstrable therapeutic value. It is obvious that any measure which increases uterine, and hence placental, nutrition must be advantageous to the development of the fœtus. The ultimate success of such treatment, however, depends on the capacity of the placenta; for if this organ is already grossly infarcted or underdeveloped it may still fail to sustain fœtal life (Morris 1955), even though the blood-flow in the uterine wall be restored to normal.

Summary

A method for the measurement of effective blood-flow in the uterine wall during pregnancy is described, using the clearance-rate technique.

Observations of the effective flow between the 30th week of gestation and term were made on 20 normotensive women, 10 normal twin pregnancies, and 10 mild and 8 severe cases of pre-eclampsia.

In twin gestation the clearance-rate was somewhat decreased compared with that in normal single pregnancy.

The effective flow was about half the normal in mild, and only quarter the normal in severe, cases of pre-eclampsia.

Measurements suggest that therapy with hypotensive drugs in severe pre-eclampsia increases the effective blood-flow in the uterine wall.

We wish to thank Mr. Norman White, Mr. J. D. S. Flew, and Prof. W. C. W. Nixon, of this hospital, and Miss M. A. M. Bigby, of the Central Middlesex Hospital, for granting us access to cases under their care; and the nurses who coöperated in this work.

REFERENCES

Ahlmark, A. (1944) *Acta physiol. scand.* **9**, 1.
Assali, N. S., Suyemoto, R. (1952) *Amer. J. Obstet. Gynec.* **64**, 1021.
Bastiaanse, M. A. van B., Mastboom, J. L. (1949) *Ned. Tijdschr. Geneesk.* **93**, 2609.
Beker, J. C. (1946) *Ibid*, **47**, 18.
— (1948) *J. Obstet. Gynæc., Brit. Emp.* **55**, 756.
Browne, J. C. M., Veall, N. (1953) *Ibid*, **60**, 142.
Käser, O. (1954) *Schweiz. med. Wschr.* **84**, 171.
Kety, S. S. (1948) *Amer. J. med. Sci.* **215**, 352.
— (1949) *Amer. Heart J.* **38**, 321.
McGirr, E. M. (1952) *Brit. med. Bull.* **8**, 192.
Meilman, E. (1953) *J. Amer. med. Ass.* **153**, 540.
Morris, N. (1953) *Lancet*, i, 322.
— (1955) In the press.
Page, E. W. (1939) *Amer. J. Obstet. Gynec.* **37**, 291.
— (1948) *Obstet. Surv., Baltimore*, **3**, 615.
Smith, G. V., Smith, O. W. (1948) *Physiol. Rev.* **28**, 1.
Venning, E. H., Singer, B., Simpson, G. A. (1954) *Amer. J. Obstet. Gynec.* **67**, 542.

ACTION OF BREATHING EXERCISES IN PULMONARY EMPHYSEMA

E. J. M. CAMPBELL
M.D., Ph.D., B.Sc. Lond., M.R.C.P.
MEDICAL REGISTRAR

JOHN FRIEND
M.D. Lond., M.R.C.P.
ASSISTANT, MEDICAL UNIT

MIDDLESEX HOSPITAL, LONDON

BREATHING exercises are often used as a treatment for pulmonary emphysema. Most patients believe that they are helped by them. The popularity of this treatment appears to depend on its subjective effect alone, since we have been unable to find any published reports of an objective assessment of its value.

The work we report here was designed as a preliminary to an examination of the long-term effects of breathing exercises. Its aim was to investigate the performance of the exercises and their mode of action on respiration so that the benefit attributed to them could be judged objectively, their technique and theoretical aims examined critically, and, if possible, the manner of performing the exercises improved.

We use the words "immediate action" to describe the changes which take place when the patient is performing breathing exercises. The word "effect" is used to denote changes which take place as a result of the patient having practised the exercises over a period of time. We have been concerned primarily with the "immediate action" of the exercises, but we have also some results of their "effects."

Material

Ventilatory function was studied in 12 emphysematous men before and after a course of instruction in breathing exercises. These patients had been tested repeatedly from the winter or spring of 1953 until the summer of that year, and the results of that prolonged observation have been published (Friend 1954).

Electromyographic examinations were made on 7 of these 12 patients before and after instruction in breathing exercises. These studies before exercises were made in the summer months when the patients had become accustomed to spirometry. They were repeated within two months of completing instruction in the exercises. In addition, cases 14–16 were examined before exercises, but they failed to attend for the exercises.

Methods

Ventilatory Function

The total lung capacity and its subdivisions, the "mixing efficiency," and the size of the "poorly ventilated space" were determined by the closed-circuit method using helium as the indicator gas. The maximum breathing capacity was measured with a spirometer of the type described by Bernstein et al. (1952). The effective tidal volume was calculated from Briscoe's (1952) formula, which applies to the mixing of inert helium inspired into the lungs and not to the measurement of the effective tidal volume from expired and alveolar air concentrations of oxygen or of carbon dioxide.

Allowance was made for an increase in the spirometer circuit and a decrease in the functional residual capacity when patients, performing breathing exercises, began the test by exhaling into the spirometer instead of, as is usual, inhaling from it.

After instruction in breathing exercises the tests were repeated, usually on several occasions, all observations except the vital capacity and maximum breathing capacity being made when the patient breathed naturally and also when as taught.

Electromyography

Recordings were taken from the sternomastoid, rectus abdominis, and external oblique muscles by the technique described by Campbell and Green (1953a). These muscles were used for the following reasons: (1) they are all easy to study with surface electrodes; (2) the sternomastoid is a well-isolated muscle of inspiration and is used only at high levels of ventilation in healthy people (Campbell 1954) (other inspiratory muscles, such as the scaleni and the intercostals, vary considerably in their activity and may be active during quiet breathing in some healthy people); and (3) the anterolateral abdominal muscles are the only muscles of expiration in which surface electrodes detect activity during increased pulmonary ventilation. Activity in intercostal muscles, even when they contract, is slight and occurs later than it does in the abdominal muscles (Campbell 1954). The abdominal muscles come into action towards the end of expiration rather than at its beginning. Activity of these muscles during or at the end of inspiration is uncommon in healthy people during increased pulmonary ventilation. It occurs regularly, however, at the end of an isolated maximum inspiration (Mills 1950, Campbell 1952, Campbell and Green 1953b).

The following tests were made on all 10 patients:

(1) Quiet breathing without spirometry.

(2) The effects of skeletal movements, such as raising the head from the couch and moving the trunk. This was done to find the electrical activity associated with slight and with vigorous contractions of the muscles.

(3) Records were taken when the patients made voluntary maximal expiratory efforts so that their activity in these circumstances could be compared with that obtained by the breathing exercises.

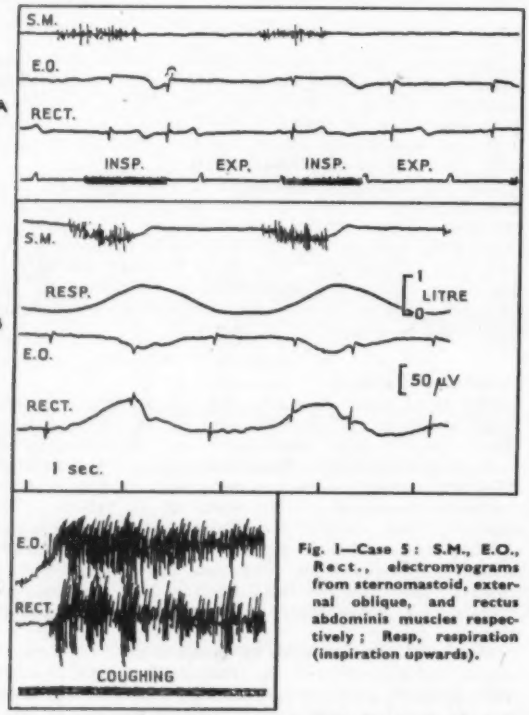


Fig. 1—Case 5: S.M., E.O., Rect., electromyograms from sternomastoid, external oblique, and rectus abdominis muscles respectively; Resp, respiration (inspiration upwards).

A, breathing without spirometry: rhythmic inspiratory activity in sternomastoid but no detectable activity in abdominal muscles.

B, after severe exercise when patient was intensely dyspnœic: no expiratory activity in abdominal muscles.

C, during mild voluntary cough (amplification and time-scale as in A and B): much activity of abdominal muscles.

TABLE I—MEAN RESULTS OF VENTILATORY-FUNCTION TESTS BEFORE BREATHING EXERCISES

—	Mean	S.D.
Age (yr.)	58·8	7·51
Total lung capacity	6·26	0·89
Vital capacity	3·14	0·18
Inspiratory capacity	1·95	0·40
Expiratory reserve volume	1·19	0·27
Residual volume	3·12	0·20
R.V./T.L.C. (%)	49·7	6·42
Mixing efficiency (%)	54·2	10·6
Poorly ventilated space/functional residual capacity (%)	23·2	5·03
Maximum breathing capacity (litres per min.)	50·4	15·5

All volumes corrected to 37°C and recorded to nearest 0·01 litre.

(4) Rebreathing expired air from the spirometer with the CO_2 absorber removed so that pulmonary ventilation increased. The patients were told that they would gradually feel the need to "breathe harder," and that they should try to relax and let this take place until they could no longer tolerate the discomfort. After one or two attempts they gave steady records showing smoothly increasing pulmonary ventilation.

In addition, 3 patients were examined supine immediately after running on the spot to the limit of tolerance, to find the extent to which abdominal muscles were used then to aid expiration.

In those patients who were re-examined after they had been taught breathing exercises the observations were repeated during natural breathing and while the patient was instructed to "breathe as you were taught."

All the manœuvres were repeated several times, and the patterns of activity described were constant and reproducible. The values recorded for the pulmonary ventilation were the largest attained by each patient. The main study was made with the patients supine because there is a liability to postural activity in all neck and trunk muscles when the patient is erect. This made the detection of respiratory variation more difficult. Observations made in the erect posture were essentially similar to those recorded with the patient supine, and nothing was found to suggest that the fundamental muscular pattern of breathing varied with posture.

Breathing Exercises

These were taught to the patients individually two or three times each week for from four to six weeks. They were of the type described by Reed (1952) and Miller (1953) and appear to be those commonly used. These workers suggested that the exercises would achieve the following aims, which we have taken as points for objective examination:

(1) The attainment of relaxation of the muscles, particularly those of the neck and upper thorax.

(2) The prolongation of expiration obtained by instructing the patient to breathe slowly out while counting up to six and then to inhale during a count of two.

(3) The development of diaphragmatic movement by active lowering of the costal margins by contraction of the lateral abdominal muscles.

(4) The inculcation of a habit of controlled even breathing.

The exercises were taught initially with the patient lying and progressed to the patient performing them sitting, standing, and finally walking. The physiotherapists were satisfied that all our patients performed the exercises satisfactorily at the end of their period of instruction.

Results

BEFORE BREATHING EXERCISES

Ventilatory Function

In table I are the detailed results of the tests made on the patients in June–August. The residual volume formed an abnormally large proportion of the total lung capacity, the mixing efficiency was reduced, and there was a large poorly ventilated space in all cases. The maximum breathing capacity in every patient was less

than 50% of the mean result in 11 healthy men, aged 50 or more, studied by one of us (J. F.).

Electromyography

Slight voluntary skeletal movements caused definite detectable activity. There was much activity in the abdominal muscles of all the patients tested on voluntary expiration and coughing (fig. 1c).

The results are set out in table II. Of the 10 patients 6 used the sternomastoid muscle during the inspiratory phase of quiet breathing. The sternomastoid was in use in all 10 patients when their pulmonary ventilation was increased by rebreathing expired air. No patient, however, used the abdominal muscles to aid expiration during quiet breathing (fig. 1a), and only 2 of the 10 used these muscles when their ventilation had increased during rebreathing.

3 patients were examined immediately after they had exercised to their limit of tolerance. Only 1 of them used his abdominal muscles during expiration.

TABLE II—MUSCULAR ACTIVITY SHOWN BY ELECTROMYOGRAPHY BEFORE INSTRUCTION IN BREATHING EXERCISES

Case no.	At rest		Rebreathing expired air		After exercise. Abd. muscles on expiration	Pulmonary ventilation on rebreathing expired air (litres per min.)
	Sternomastoid on inspiration	Abd. muscles on expiration	Sternomastoid on inspiration	Abd. muscles on expiration		
2	+	–	+	–	..	22·5
5	+	–	+	–	–	21·0
8	–	–	+	–	..	22·0
9	+	–	+	+	..	24·0
10	–	–	+	+	+	27·0
12	+	–	+	–	–	11·0
13	–	–	+	–	..	29·0
14	–	–	+	–	..	26·0
15	+	–	+	–	..	8·5
16	+	–	+	–	..	23·0

DURING BREATHING EXERCISES

Ventilatory Function

The results of pairs of tests taken on the same day, one while the patient was breathing naturally and the other during breathing exercises, are shown in table III.

Fig. 2, a spirometric tracing from case 5, shows two periods of natural breathing with a three-minute period of breathing exercises between them. As in most of the patients studied, respiration during the exercises was performed entirely below the normal resting respiratory level, at an increased depth, and at a slower rate. The enlarged tidal volume was more than balanced by the decreased respiratory rate; hence in 10 of the patients the minute volume was smaller during the exercises than during natural breathing. Some patients could not restrict their inspiration to their normal resting respiratory level; hence their tidal volume during the exercises included part or all of their normal tidal volume above this level.

The expiration of exercise-breathing was nearly as deep as the patient could achieve in attempting to produce his vital capacity. This depth was obtained during the exercises, as it had been in the vital capacity test, by a considerable lengthening of the time taken to exhale the breath, the average respiratory rate being about 9 breaths a minute. Inspiration was rapid.

Oxygen consumption was not altered to any significant extent when measured over a three-minute period of breathing exercises in each patient. This was shown by an unchanged resting respiratory level when natural breathing was resumed after the period of exercise breathing.

With the increased tidal volume of exercise-type breathing helium was mixed more rapidly in the lungs than with natural breathing. The mixing curve, in which the decrease of concentration of helium in the spirometer circuit is plotted against time, was consequently much steeper. It still showed, however, an inflection at the same point on the ordinate scale as was found in the mixing plot with natural breathing. The "poorly ventilated space" was thus unaltered in size. Furthermore, although the two component lines of the mixing plot were both steeper than those obtained with natural breathing mixing of helium, their slope relative to each other remained the same. The "mixing efficiency" was consequently unchanged by exercise-type breathing.

TABLE III—MEAN RESULTS OF VENTILATORY-FUNCTION TESTS DURING NATURAL BREATHING AND EXERCISE-TYPE BREATHING

—	Breathing	Mean	S.D.
Tidal volume	N	0·54	0·12
	E	0·92	0·19
Respiratory rate	N	19·5	4·46
	E	9·0	1·77
Minute volume	N	10·04	1·43
	E	8·15	2·04
Effective tidal volume	N	0·09	0·03
	E	0·31	0·10
Effective minute volume	N	1·69	0·14
	E	2·70	0·93
E.T.V./T.V. (%)	N	16·8	3·49
	E	32·6	6·49
Mixing efficiency (%)	N	51·0	12·57
	E	48·6	9·43
Poorly ventilated space/functional residual capacity (%)	N	24·3	4·47
	E	25·5	6·62

E, exercise-type. N, natural.
All volumes corrected to 37°C and recorded to nearest 0·01 litre.

During natural breathing, in all patients an abnormally small fraction of each breath was effective in mixing the inspired helium in the lungs. Exercise-type breathing produced an increased effective tidal volume, and the effective tidal volume/tidal volume ratio was also increased. This led to an increase in the effective minute volume in every patient, despite the reduced total minute volume in 10 of them.

Electromyography

When the patients did not consciously breathe as they had been taught, there was no change in the electromyographic pattern either during quiet breathing or when the ventilation was increased by rebreathing expired air. Recordings made when the patients performed their exercises showed activity in the abdominal muscles. This was always considerably greater in the oblique

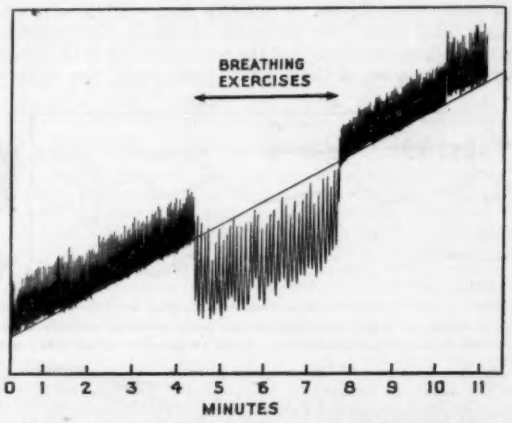


Fig. 2—Case 5: record of respiration and oxygen consumption in two periods of natural breathing with a period of breathing exercises between them. Read from left to right. Inspiration upwards.

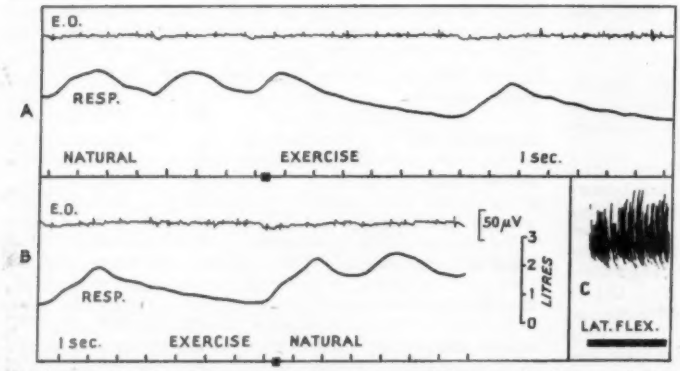


Fig. 3—Case 13: E.O., electromyogram from external oblique muscle; Resp, respiration (inspiration upwards).

A and B, continuous record beginning and ending with natural breathing: between signal marks is a period of breathing exercises in which there is only slight activity in the external oblique (no activity was detected in the rectus abdominis).

C, record taken when patient tried to bend sideways: no actual movement took place but activity recorded was considerable.

muscles than in the rectus abdominis. The muscular activity developed during the exercises was slight compared with that produced on voluntary expiratory efforts (fig. 3), except in the 2 patients who had shown expiratory activity in the abdominal muscles before being treated with the exercises.

A reduction in the intensity of the activity in the sternomastoid muscle during exercise-type breathing was observed only occasionally. The explanation for the continued inspiratory action of this muscle appeared to be that, although inspiration took place below the normal resting respiratory level, the rate of inspiration during the exercises was increased.

During rebreathing from the spirometer the patients had to be exhorted continuously to "breathe as you were taught," for they tended to stop doing their exercises (shown by a reduction of intensity of their expiratory abdominal contractions) as their ventilation increased (fig. 4). When the patients were recovering from this hyperventilation, their abdominal contractions stopped despite obvious and considerable breathlessness.

EFFECTS OF BREATHING EXERCISES

In a follow-up of about three months, during which the patients continued to practise their exercises, it was found that, when they breathed naturally, the exercises had not significantly altered the total capacity of the lungs, the relative sizes of their component parts, the method of mixing inspired air in the lungs, or the maximum breathing capacity.

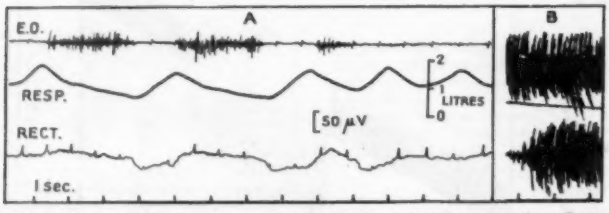


Fig. 4—Case 8: E.O., electromyogram from external oblique muscle; Rect., that from rectus abdominis; Resp, respiration (inspiration upwards).

A, end of a record taken while patient was rebreathing expired air to the limit of tolerance: although the external oblique contracted initially to a moderate extent, the contractions ceased as the patient became distressed.

B, towards end of voluntary maximal expiration, showing large amount of activity of which the muscles are capable.

Discussion

All our patients had been seen repeatedly, and their ventilatory function had been tested on numerous occasions before they were taught breathing exercises. This long period was undertaken deliberately so that the breathing exercises should be started only when the patients were no longer improving symptomatically and the results of tests of ventilatory function showed no trend of improvement. When the exercises were begun in the summer, we thought that the bronchitis had been reduced as much as possible and that any learning factor affecting the tests had been overcome. The day-to-day variation of the ventilatory-function tests was then no greater than that found on repetition of the tests on the same day (Friend 1954).

We did not intend a long-term examination of the effects of breathing exercises and so did not attempt to control our observations by the provision of untreated patients. For an investigation of the "immediate action" of the exercises no such control was necessary.

The "immediate action" of breathing exercises in our patients was as follows: (1) there were a decrease in the rate and an increase in the depth of breathing; (2) despite the slower rate of breathing the increase in the effective tidal volume was so great that the effective minute volume was larger than in natural breathing; (3) the "mixing efficiency" and "poorly ventilated space" were unaltered; (4) there was a lowering of the respiratory level, with the result that the chest was less inflated during the exercises; (5) expiration was much prolonged; (6) there was no change in the pattern of activity of the sternomastoid muscle, but the abdominal muscles, which were usually inactive during natural breathing, were used when the exercises were performed. The intensity of this activity was greater in the oblique muscles than in the rectus abdominis but was slight compared with the potential activity of these muscles.

The theoretical aims of breathing exercises may be examined in the light of our findings:

(1) *To relax the accessory muscles of inspiration.*—In most of our patients there was complete and rapid relaxation of the sternomastoid muscle at the end of inspiration before breathing exercises were taught. Relaxation was not accelerated by the exercises. There is no reason to presume that further "active" relaxation might be obtained.

(2) *To increase diaphragmatic movement by active lowering of the costal margins by contraction of the lateral abdominal muscles.*—Wade (1954) has shown that the diaphragm cannot be controlled voluntarily, and has directed attention to the fallacy of drawing conclusions about the extent of diaphragmatic movement from movements of the anterior abdominal wall. We were impressed by the attention the patients paid to trying to move part of the chest and abdominal wall selectively. We found no evidence that these efforts affected ventilatory function. They did, however, add greatly to the patients difficulty in learning the exercises.

(3) *To obtain use of the lung bases by localised lateral basal expansion.*—There is no reason to presume that selective movement of a particular area of chest wall is necessarily accompanied by better ventilation of the underlying lung. Our tests of ventilatory function showed no reduction in the size of the "poorly ventilated space" and no improvement in the "mixing efficiency" when the patients performed breathing exercises.

(4) *To make expiration the active phase of respiration.*—This involves two separate actions: (*a*) prolongation of expiration and (*b*) increase of the depth of expiration. Merely prolonging the duration of expiration has no value. As expiration is continued in emphysematous patients the rate of expulsion of air decreases greatly. Exercise-type breathing demands a nearly complete expiration for each breath and produces a fixed respiratory rate of about 9 a minute. This causes a limitation of the minute volume at a level below that needed for even moderate physical exertion. Our patients could not perform their exercises during physical activity and had then to revert to natural breathing.

So far as ventilatory function is concerned, the changes which we have found with breathing exercises are those of slow deep breathing.

The "immediate action" of the exercises on the mechanics of breathing may warrant further attention. Inspiration is mechanically inefficient in ventilating the lungs in emphysema, where the chest is raised and expanded and the diaphragms are flattened and depressed. If, however, the chest is deflated by a preliminary expiration, the inspiratory muscles can act more efficiently. Furthermore, initial deflation of the lungs and active lowering of the end expiratory level increase the rate of mixing of inspired air in the lungs, as Bates et al. (1954) demonstrated in healthy people by the nitrogen-clearance method.

Active expiration would be achieved as effectively by the short expiratory exercises used by Reed (1952) to overcome breathlessness, without the disadvantages attached to the prolongation of expiration of the long-expiration exercises. A simple sharp contraction of all the abdominal muscles would produce as great an elevation of the diaphragm as do the complicated attempts to lower the costal margins by contraction of the lateral abdominal muscles alone in the long-expiration exercises.

Although our patients did not make full use of active expiration when they did their exercises, several of them, made breathless by physical exertion, appeared to be relieved of their dyspnœa more rapidly by exercise-breathing than by natural breathing. This is the only evidence that we have obtained of any benefit to be attributed to the exercises, but it was not controlled by ventilation or blood-gas studies.

There was no question of strengthening the abdominal muscles by the exercises, for they were adequately developed in all patients and, judged electromyographically, had large reserves (figs. 3 and 4).

It is not easy to foresee any "effect" of breathing exercises, even if practised for a long time. It is difficult to imagine that breathing could ever be so radically changed that expiration should become the active phase. Our patients showed no signs that their usual mode of breathing had been altered in any way by the exercises. They still performed them as a set and conscious act.

Summary

The "immediate action" of breathing exercises has been studied in 12 emphysematous men by tests of ventilatory function and by electromyography.

The changes found were those associated with slow deep breathing in an increasedly expiratory position.

In a short period of time the exercises produced no "effect" upon ventilatory function.

We wish to thank Prof. A. Kekwick and Prof. Samson Wright, in whose departments this work was done, for their help and advice; Mr. W. F. Floyd for his guidance with the electromyography; Mr. E. E. Dowset for his technical assistance; Dr. K. W. Donald, and Dr. F. H. Scadding for reading the manuscript; Miss M. C. Devers and Miss R. Strachan for teaching the exercises to our patients; and the patients for their ready coöperation. The electromyographic studies reported here formed part of a thesis by one of us (E. J. M. C.) accepted for the doctorate of philosophy by the University of London. This work was done during the tenure of the Saltwell scholarship of the Royal College of Physicians by one of us (J. F.).

REFERENCES

Bates, D. V., Fowler, W. S., Forster, R. E., Van Lingen, B. (1954) *J. appl. Physiol.* **6**, 598.
Bernstein, L., D'Silva, J. L., Mendel, D. (1952) *Thorax*, **7**, 255.
Briscoe, W. A. (1952) *Clin. Sci.* **11**, 45.
Campbell, E. J. M. (1952) *J. Physiol.* **117**, 222.
— (1954) Ph.D. thesis, University of London.
— Green, J. H. (1953a) *J. Physiol.* **122**, 282.
— — (1953b) *Ibid*, **120**, 409.
Friend, J. (1954) *Clin. Sci.* **13**, 491.
Miller, M. E. (1953) *Bull. Johns Hopk. Hosp.* **92**, 185.
Mills, J. N. (1950) *J. Physiol.* **111**, 376.
Reed, J. M. W. (1952) *In* Marshall, G., Perry, K. M. A. Diseases of the Chest. London.
Wade, O. L. (1954) *J. Physiol.* **124**, 193.

TETANY COMPLICATING THE TREATMENT OF POTASSIUM DEFICIENCY IN RENAL ACIDOSIS

PAUL FOURMAN
M.D. Lond., M.R.C.P.

R. A. MCCANCE
C.B.E., M.D., Ph.D. Camb., F.R.C.P., F.R.S.
PROFESSOR OF EXPERIMENTAL MEDICINE IN THE UNIVERSITY OF CAMBRIDGE

From the Medical Research Council Department of Experimental Medicine, University of Cambridge

TETANY has been described in patients with potassium deficiency and has been reproduced experimentally during potassium deficiency in normal persons (Fourman 1954). Potassium deficiency due to an abnormality of renal function has also been described before, usually but not always associated with a renal acidosis and often also with a concomitant loss of calcium or phosphate (Brown et al. 1944, Albright et al. 1946, Hadorn 1948, Earle et al. 1951, Milne et al. 1952, Squires et al. 1953). These specific renal lesions have not yet been produced experimentally, and the potassium deficiencies associated with them can be studied only by the observations and tests which it is possible to make on patients.

Our reasons for describing this case are (1) to show how tetany, as a complication of recovery from potassium deficiency, dominated the whole treatment of the patient; (2) to place some of the results on record for future reference; and (3) to make some comments of a more theoretical nature on the causation of the tetany.

Methods

Sodium and potassium were determined with an internal standard flame photometer. The pH was determined with a glass electrode at 37°C and the measurements were checked by the determinations of plasma-bicarbonate and alveolar carbon dioxide. The analysis of muscle was based upon Mudge and Vislocky (1949). Other methods were based upon Hawk et al. (1947).

Case-report

A.B. was a single woman, born in 1909. Her health had been good until November, 1951, when she noticed that she easily became breathless; she began to have nocturia and was abnormally thirsty. She had never had dysuria, hæmaturia, or œdema.

In February, 1952, she had an emergency laparotomy in Norwich for an attack of lumbar and abdominal pain, and a normal appendix was removed. After the operation she collapsed and remained in stupor for a week with a flaccid paralysis of her face, neck, and limbs, accompanied by difficulty in swallowing, weakness of the voice, and very severe constipation; when conscious she had double vision. She was given some potassium chloride, and she recovered from her paralysis, but the treatment was then abandoned. She continued to have three or four attacks of paralysis a month, each lasting for a few days. No potassium was given for these attacks. She remained very ill, and vomited nearly every morning; in 6 months she lost 70 lb. in weight.

In July, 1952, she was admitted to the East Suffolk Hospital under Dr. Ronald Jones. Her alarming condition first led to

the diagnosis of an addisonian crisis ; but her serum-potassium was found to be only 1·8 m.eq. per litre, and potassium chloride was immediately administered. She rapidly became stronger, and after taking 200 m.eq. (15 g.) daily for a fortnight she could walk for the first time in 5 months and was no longer constipated. A smaller dose failed to control her symptoms, and treatment with 200 m.eq. of potassium chloride was therefore continued. At this time she began to gain weight.

In August, 1952, she began to have attacks of tetany once or twice a week, lasting from 15 minutes to several hours. She had a feeling of coldness and tingling in her limbs before the attacks, and then her hands, her feet, and her face went into spasm and her limbs were covered with sweat. The spasms might begin at any time of the day, and, although they were apt to come on soon after a dose of potassium, they occasionally started early in the morning before she had had any treatment for that day. Calcium, given as 6 g. of the gluconate daily by mouth, did not prevent the attacks, and we subsequently established that injections of calcium gluconate, up to 4 g. intravenously, did not shorten them. There was never any suggestion of overbreathing or air-hunger, and the attacks were not relieved by breathing into a bag or by breathing 5% carbon dioxide. Measures calculated to reduce the serum-potassium, such as the administration of glucose or the injection of adrenaline (Castleden 1938), have since been found to have no effect.

At the time of the attacks of tetany A.B. sometimes had œdema of the eyelids and of the ankles, which had been preceded by excessive thirst. Trousseau's sign could often be elicited, but her spasm relaxed slowly when pressure on the nerve-trunk was released ; consequently we were unable to reproduce Lewis's observations (1942) on the phenomenon. In her, therefore, the spasm may have been due to more than ischæmia of the nerve-trunk.

ROUTINE INVESTIGATIONS

When the patient was admitted to Addenbrooke's Hospital in July, 1953, for further investigation, no potassium chloride had been administered for 3 weeks except on four occasions to relieve attacks of transient paralysis.

On admission she was found to have only 2·5 m.eq. of potassium per litre of serum. At the same time she had 116 m.eq. of chloride and 18·7 m.eq. of bicarbonate. The serum-calcium was 9·1 mg. per 100 ml. The rest of her serum-electrolytes (sodium, phosphorus, and magnesium) were normal, but in spite of the acidosis her urinary pH was of the order of 7·0. The urine usually contained a trace of protein and a heavy deposit of phosphates ; it contained no sugar, very little ammonia, and no abnormal cells or casts, and it was always sterile. The specific gravity was 1010 after depriving the patient of water for 18 hours. The blood-urea, which had been 25 mg. per 100 ml. in July, 1952, was now 38 mg., and her urea-clearance was 49% of normal. Her endogenous creatinine clearance was 53 ml. per min. ; and she excreted only 50% of 6 mg. of phenosulphonephthalein in 2 hours and 40% of 1 litre of water in 2½ hours. Her glomerular and tubular function, therefore, were both well below the normal. X-ray examination revealed renal calcinosis.

She excreted large amounts of potassium even when the serum-potassium was low, and occasionally, as in similar cases (Earle et al. 1951), her renal clearance of potassium was greater than could be accounted for by glomerular filtration. Her kidneys conserved sodium well when the intake of sodium was very small and she maintained a normal calcium balance. Her clearance of phosphate averaged 11·2 ml. per min. over 24-hour periods and was within normal limits although her glomerular filtration-rate was low (Milne et al. 1952).

The only other abnormal finding was the high concentration of the proteins in the plasma ; fractionation and paper-strip electrophoresis showed that the increase was entirely in gamma-globulin. Her liver was, however, functionally normal and she had no evidence of sarcoidosis.

SPECIAL INVESTIGATIONS AND TREATMENT

Many minor investigations, balance experiments, and a muscle biopsy have been made on this patient, and only a summary of the pertinent ones will be given here.

Characterisation of the Renal Acidosis

112 m.eq. of ammonium chloride was given daily for 3 days when the patient had been receiving 200 m.eq. of potassium daily for some time as the chloride, and no citrate was being given. The serum-bicarbonate fell from 14·3 m.eq. to 10·7 m.eq. per litre and the chloride, which was already over 120 m.eq., scarcely changed. There was little change in the pH of her urine or of her plasma, which at this time was 7·21. The urinary ammonium and titratable acidity increased only slightly. The sodium excretion rose by 71 m.eq. per day, the potassium by 60 m.eq. and the calcium by 8 m.eq.

Effects of Treatment with Potassium Chloride

When she was first admitted to Addenbrooke's Hospital and was not having any treatment, she was found to be losing about 44 m.eq. of potassium daily and her serum-potassium was 2·5–3·0 m.eq. per litre. Under treatment with 200 m.eq. daily she retained 600 m.eq. in 3 weeks, by which time her serum-potassium was normal ; but she still had an acidosis similar in magnitude to the one she had had on admission and her plasma pH ranged between 7·25 and 7·29. She had only occasional cramps at this time.

Effect of Treatment with Citrate

Some time after she began to have periodic attacks of tetany in Ipswich, Dr. Jones changed her treatment from 200 m.eq. of potassium chloride daily to 140 m.eq. of potassium citrate. This made her tetany so much worse that the patient gave up the citrate and returned to the chloride. After she had been re-established at Cambridge on potassium chloride alone, the advantages which would probably be gained if her acidosis could be corrected made us give her 100 m.eq. of sodium citrate daily, and we were then able to reduce the dose of potassium chloride from 200 to 50 m.eq. daily. This treatment made her serum chemistry entirely normal and raised the plasma pH to 7·4, but the patient then had intermittent attacks of tetany. At this time the serum-calcium was 9·6 and the plasma-bicarbonate 26 m.eq. per litre. In spite of her tetany she began to put on weight and felt better than she had done for a couple of years. Omitting the potassium chloride completely for a week did not abolish the tetany.

On 50 m.eq. of potassium chloride daily plus 50 m.eq. of sodium citrate she still had some attacks of tetany although her serum-bicarbonate was only 17 m.eq. per litre. Since both the administration of potassium and also a high intake of sodium citrate appeared to aggravate her tetany, the intake of potassium was kept as low as possible, and all of it was given as the citrate, and the sodium citrate correspondingly reduced. Thus, 30 m.eq. of potassium citrate plus 75 m.eq. of sodium citrate kept her serum-bicarbonate normal and did not produce any serious attacks of tetany for several months, by which time she had gained 20 lb. in weight (from the time of her admission to Addenbrooke's) and was scarcely recognisable to those who had not seen her since then. After about 5 months she had some quite severe attacks of tetany with œdema, although her serum-potassium had fallen from 4 to 3·3 m.eq. per litre, and this suggested that she might be better with more potassium but less sodium citrate. Consequently her treatment has now been changed to 60 m.eq. of potassium and 50 m.eq. of sodium citrate, and this controls her acidosis and her potassium deficiency, but she still gets occasional attacks of tetany in her hands and feet.

The Muscle Biopsy

On Feb. 10, 1954, at 4 P.M., under a general anæsthetic, a portion of the patient's triceps was removed. She had had an attack of tetany that day at 9 A.M. The serum chemistry at the time of operation and the composition of the triceps muscle are shown in the accompanying table. The figures obtained may be compared with those of Talso et al. (1953), who analysed portions of normal skeletal muscle taken from sixteen adult men and women. All the values fall within the limits found by Talso et al., but the concentrations of sodium and potassium were both in the upper ranges of normal and the sum of the two exceeded the average of Talso et al. by more than twice the standard deviation.

SERUM AND MUSCLE CHEMISTRY AT 4 P.M. ON FEB. 10, 1954. THE PATIENT HAD HAD AN ATTACK OF TETANY AT 9 A.M.

—	Serum	Muscle total	Muscle cell *
Protein nitrogen × 6·25 (g. per 100 g.)	8·8	20·2	..
Fat	..	0·08	..
Water (by evaporation)	..	76·8	61·2
Sodium (m.eq. per litre of water)	155	47	24
Potassium (m.eq. per litre of water)	4·8	127	160
Chloride (m.eq. per litre of water)	116	18·8	..

* Calculated as in Lowry and Hastings (1942).

Discussion

The Basis of Treatment

Many patients with an acidosis excrete large amounts of calcium in their urine and may in consequence get calcinosis of their kidneys. This patient's kidneys were calcified although she was excreting very little calcium in her urine, and alkalinity of the urine was probably the cause. It was established both at Ipswich and at Cambridge that the administration of calcium salts did not relieve her tetany. This was a valuable discovery, for the natural temptation might have been to treat her with calcium, and the result could only have been further deposition of calcium salts in and around her tubules.

Tetany not due to a calcium deficiency is usually associated with an alkalosis of the extracellular fluid, and the tetany of potassium deficiency has been attributed to this by Darrow et al. (1948). Our patient's tetany, however, was not controlled by breathing 5% carbon dioxide or by rebreathing her own expired air, which would seem to suggest that the cause was not simply an extracellular alkalosis. Nevertheless, once her potassium deficiency had been corrected, her tetany seemed to be aggravated by the subsequent correction of her extracellular acidosis.

The Problem of the Tetany

Black and Milne (1952) induced potassium deficiency while the intake of sodium was generous. They found that the potassium deficiency was associated with an extracellular alkalosis and probably less Na + K than usual in the cells. They did not produce tetany at any stage of their experiments. Fourman (1954) induced potassium deficiency while the absorption of sodium was kept very small. The deficiency of potassium was accompanied by an acidosis of the extracellular fluid and probably less than the normal amount of Na + K in the cells. The administration of sodium at this stage, in doses comparable to those of Black and Milne, corrected the extracellular acidosis without inducing an obvious alkalosis, and the subjects got tetany. Balance experiments indicated that the sum of the Na + K ions in the cells was high at this time. The tetany in these experiments was preceded by the appearance of œdema.

Tetany was repeatedly observed in our patient (*a*) when there was no hypocalcæmia, (*b*) when there was no alkalosis in the extracellular fluids, and (*c*) when no rapid increase in the serum-potassium had taken place (cf. Bedford 1954). Thus none of the well-known mechanisms can be invoked to explain it. It was first produced by the administration of potassium chloride, in the presence of a normal serum-potassium and a pronounced extracellular acidosis, and it has frequently been observed since with a normal serum chemistry. Since there was no change in the extracellular fluids to account for our patient's tetany—and this may also be true of persons suffering from overbreathing tetany (McCance 1932)—a change in the composition of the intracellular fluids may be more important in the production of tetany than the changes in the extracellular fluid which are generally regarded as responsible.

Evidence that the intracellular fluids are alkaline in the tetanies of potassium deficiency, or at any rate contain more than the normal concentration of Na + K, rests at present on our patient's biopsy and Fourman's (1954) balance studies. Furthermore there is no evidence on changes in the composition of nerves, and information about both these points is desirable.

Whatever the mechanism of this patient's tetany, some personal idiosyncrasy must be invoked to explain why she remained so prone to tetany for such a long time after her potassium deficiency had been made good and her serum chemistry had been satisfactorily corrected. This was not the reaction of a normal person, although overbreathing tetany is occasionally induced remarkably easily. It may be that our patient's cells are peculiarly sensitive to external changes, such as the correction of an extracellular acidosis, which would by themselves be insufficient to induce tetany in an experimental volunteer; but it seems more probable that her cells are themselves abnormal in the way in which they take up and retain potassium and perhaps sodium as well.

Summary

A patient with potassium deficiency due to renal acidosis developed severe tetany when her serum-potassium was raised to normal by the administration of potassium chloride.

Her serum chemistry during the attacks was normal, except for the acidosis, which was not corrected by the potassium chloride.

Her tetany was not relieved by the administration of calcium or by breathing 5% carbon dioxide.

The most successful method of correcting the potassium deficiency and the acidosis while avoiding tetany as far as possible has been to give relatively small doses of potassium and sodium citrates.

No facts known at present will explain this patient's tetany, and it has been suggested that it is due to a derangement of the normal control of the intracellular pH or cation concentration.

We are indebted to Dr. Ronald Jones for bringing the patient to our notice; to Dr. A. B. Morrison, Dr. G. R. Hervey, and Dr. J. R. Robinson for help at all stages of the investigation; to Dr. R. N. Laurie and members of the department of clinical biochemistry, Addenbrooke's Hospital, for a large number of routine biochemical investigations; to Mr. R. W. Butler, F.R.C.S., for performing the muscle biopsy; and to Mr. J. Dickerson, B.SC., and Miss E. Colbourn and Miss Anne Stockbridge for their assistance.

REFERENCES

Albright, F., Burnett, L. H., Parson, W., Reifenstein, E. C. jun., Roos, A. (1946) *Medicine, Baltimore*, **25**, 399.
Bedford, P. D. (1954) *Lancet*, ii, 268.
Black, D. A. K., Milne, M. D. (1952) *Clin. Sci.* **11**, 397.
Brown, M. R., Currens, J. H., Marchand, J. F. (1944) *J. Amer. med. Ass.* **124**, 545.
Castleden, L. I. M. (1938) *Clin. Sci.* **3**, 241.
Darrow, D. C., Schwartz, R., Iannucci, J. F., Colville, F. (1948) *J. clin. Invest.* **27**, 198.
Earle, D. P., Sherry, S., Eichna, L. W., Conan, N. J. (1951) *Amer. J. Med.* **11**, 283.
Fourman, P. (1954) *Lancet*, ii, 525.
Hadorn, W. (1948) *Schweiz. med. Wschr.* **78**, 1238.
Hawk, P. B., Oser, B. L., Summerson, W. A. (1947) Practical Physiological Chemistry. Philadelphia.
Lewis, T. (1942) *Clin. Sci.* **4**, 361.
Lowry, O. H., Hastings, A. B. (1942) *J. biol. Chem.* **143**, 257.
McCance, R. A. (1932) *Quart. J. Med.* **28**, 247.
Milne, M. D., Stanbury, S. W., Thomson, A. E. (1952) *Ibid*, **21**, 61.
Mudge, G. H., Visloczky, K. (1949) *J. clin. Invest.* **28**, 482.
Squires, R. D., Huth, E. J., Elkinton, J. R. (1953) *Ibid*, **32**, 605.
Talso, P. J., Spafford, N., Blaw, M. (1953) *J. lab. clin. Med.* **41**, 281.

MALIGNANT ARGENTAFFINOMA WITH CYANOSIS AND PULMONARY STENOSIS

J. S. JENKINS
M.D. Camb., M.R.C.P.
MEDICAL REGISTRAR

P. J. A. BUTCHER
M.B. Lond.
DEMONSTRATOR OF PATHOLOGY

ST. BARTHOLOMEW'S HOSPITAL, LONDON

THE association of malignant argentaffinoma with cyanosis and pulmonary stenosis was first recognised by Biörck et al. (1952). An account of Biörck's original case, and of five others, was given recently by Thorson et al. (1954), who discussed ten further cases that had been published elsewhere, including three with similar features reported by Isler and Hedinger (1953). Branwood and Bain (1954) have lately discussed in these columns a case which they recognised in retrospect as having the syndrome first described by the Swedish workers. We now present two further examples of this interesting condition.

Case 1.—A housewife, aged 63, was admitted to hospital in November, 1952, complaining of intermittent attacks, over eighteen months, of watery diarrhœa and lassitude. In October, 1951, she had noticed a patchy bluish coloration of the skin which became increasingly obvious during the next year. Four months before admission œdema of the legs developed.

Fig. 1—The skin appearance in case 1.

On admission the most striking feature was the appearance of the skin, which was brick-red in colour, with blotchy areas of cyanosis; the discoloration, which varied from time to time, was most prominent on the trunk (fig. 1). Blanching could be produced by pressure. There was pitting œdema of the legs. The jugular venous pressure was not raised. A loud systolic murmur was heard over the whole precordium. The pulse-rate was 76 per min. and regular. The blood-pressure was 95/65 mm. Hg. The liver was palpable 6 cm. below the costal margin, and had a firm irregular surface.

Investigations.—Hæmoglobin 72% (10·7 g. per 100 ml.); red cells 4·3 million per c.mm.; white cells 10,000 per c.mm., with a normal differential count. Erythrocyte-sedimentation rate (E.S.R.) 5 mm. in one hr. (Westergren); bleeding-time (Duke) two min. Spectroscopy revealed no abnormal blood pigments. Radiography of the chest showed that the transverse diameter of the heart was normal. An electrocardiogram revealed myocardial damage. Radiological examination of the gastro-intestinal tract showed that in the region of the distal jejunum and proximal ileum there was segmentation which altered during the examination and could be obliterated by palpation, indicating that it was due to variations in muscle tone. A biopsy of skin showed intimal thickening and narrowing of the small arterioles.

Progress.—The diarrhœa and œdema persisted. She was mentally alert until two weeks before her death when there was an abrupt change in her personality, she became confused, and the cyanosis became much deeper. She died in coma, ten weeks after admission.

Necropsy (Dr. R. Cureton).—The colour of the skin after death was much less striking than during life. The heart weighed 260 g. and showed no obvious abnormality of the valves or cavities. In the medial wall of the cæcum there was a whitish growth measuring 3·5 × 3·0 × 2·0 cm., and the adjacent lymph-nodes were infiltrated by similar tissue. The rest of the large intestine and the small intestine appeared normal. The liver weighed 1940 g. and showed a large number of white metastases, up to 2·5 cm. in diameter. Both ovaries contained white rounded masses. All other organs appeared normal, apart from the lungs, which showed patches of bronchopneumonia.

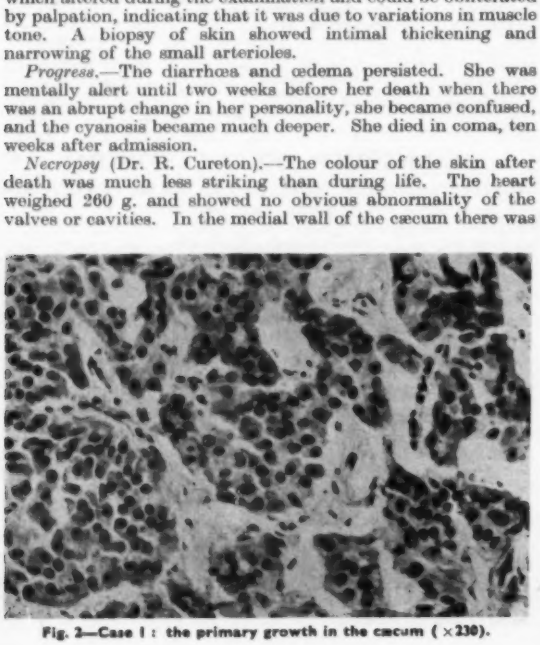


Fig. 2—Case 1: the primary growth in the cæcum (×230).

Histological examination of the cæcum showed that the growth was in the submucosa, infiltrating the muscle and extending at one point into the mucous membrane. The arrangement and shape of the cells were those of an argentaffinoma (fig. 2) and this was confirmed by demonstrating silver-staining granules in the cytoplasm of the cells. Metastases with similar characteristics were present in the adjacent lymph-nodes, the liver, and the ovaries.

Case 2.—A housewife, aged 59, was admitted to hospital in May, 1953, complaining of shortness of breath and intermittent diarrhœa of two years' duration. Four months before admission she noticed swelling of the abdomen, and for three weeks there had been swelling of the ankles. There was no previous history of rheumatic fever.

On admission a malar flush was present. The jugular veins were engorged up to the angle of the jaw and were pulsating. The heart did not appear to be enlarged clinically, but a rough systolic murmur was audible at the apex, the xiphisternum, and, loudest of all, at the pulmonary area. The pulse was regular at 68 per min., and the blood-pressure was 90/68 mm. Hg. The abdomen was distended with ascites; after paracentesis, which yielded clear straw-coloured fluid, the liver was found to be hard and to extend 5 cm. below the costal margin. Œdema of the legs extended up to the thighs.

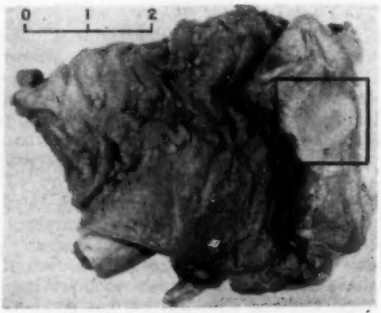


Fig. 3—Case 2: specimen showing the primary growth (outlined) in the ileum.

Investigations.—Hb 98% (14·5 g. per 100 ml.); red cells 5·4 million per c.mm.; white cells 4000 per c.mm., with a normal differential count. E.S.R. 4 mm. in one hour (Westergren); serum-proteins 5·7 g. per 100 ml. (albumin 4·4 g., globulin 1·3 g.); electrophoretic pattern normal. The bromsulphthalein test suggested severe liver dysfunction. Chest radiography and fluoroscopy revealed a small right-sided pleural effusion and elevation of the right dome of the diaphragm. There was slight enlargement of the right ventricle, the pulmonary-artery shadow was inconspicuous, and the peripheral pulmonary vessels were poorly seen. The left auricle was not enlarged. An electrocardiogram showed inversion of T waves, due to digitalis therapy, but normal PQRS waves.

Progress.—On these findings a diagnosis of pulmonary stenosis and congestive heart-failure was made, and she was treated with digitalis and mersalyl. The diarrhœa continued and she became more cachectic. She died in coma eight weeks after admission.

Necropsy.—The body was grossly wasted. The peritoneal cavity contained about four pints of serous fluid. At a point half-way along the ileum there was a hard white submucous nodule measuring 1·0 × 1·0 × 0·25 cm. (fig. 3). The rest of the intestine was normal. Two enlarged lymph-nodes were seen in the porta hepatis. The liver weighed 2385 g., and in the right lobe there was a hard white mass 10 cm. in diameter (fig. 4). The heart weighed 315 g. The myocardium appeared normal; all valve-cusps showed some thickening, but the chordæ tendinæ and papillary muscles were normal. There was stenosis of the pulmonary valve, the orifice admitting one finger-tip only. The tricuspid orifice was moderately dilated. The aortic and mitral orifices were normal in size. All other organs were normal, apart from the lungs which showed areas of bronchopneumonia.

Histological examination of the nodule in the ileum showed invasion of the submucous and muscle coats by a diffuse

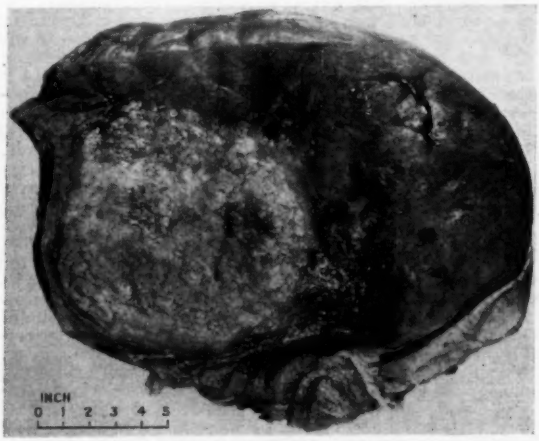


Fig. 4—Case 2: metastases in the liver.

anaplastic growth which was also infiltrating the lymph-sinuses. The cells of this growth were spheroidal and had deeply staining rounded nuclei; they were arranged in masses with a tendency to gland formation. The appearances were those of an argentaffinoma (fig. 5). Sections of the liver and of the lymph-nodes in the porta hepatis showed similar neoplastic tissue.

Discussion

In the series reported by Thorson et al. (1954) the main findings were malignant argentaffinoma of the intestine with metastases in the liver, a peculiar patchy cyanosis and transient vasodilatation of the skin, pulmonary stenosis, and tricuspid incompetence. Diarrhœa and peripheral œdema were commonly present, and in some instances there was ascites.

The two cases reported here both presented with long-standing diarrhœa and peripheral œdema, with the addition of ascites in case 2. The vasomotor changes seen in the skin in case 1 are so characteristic that Thorson et al. maintain that their recognition should lead to a presumptive clinical diagnosis of metastasising argentaffinoma. Although valve lesions were not found in case 1 at necropsy, a loud precordial systolic murmur was heard during life. Case 2 did not show widespread cyanosis but only a malar flush. In this case, however, there was clinical evidence (confirmed at necropsy) of pulmonary stenosis and tricuspid incompetence. In both cases necropsy revealed an argentaffinoma of the intestine which had metastasised extensively—to the liver, lymph-nodes, and (in case 1) ovaries.

It seems that widespread metastases are necessary for skin and cardiac lesions to develop, since these have not been reported in cases in which the argentaffin tumour remained localised to the intestine.

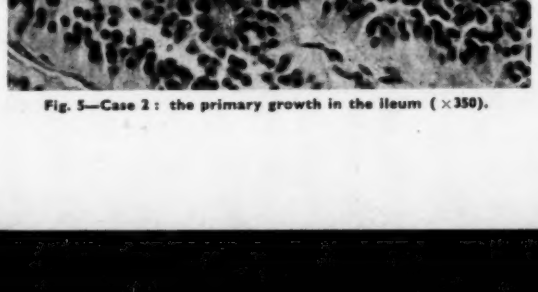


Fig. 5—Case 2: the primary growth in the ileum (×350).

The importance of this syndrome lies in the fact that, according to Thorson et al., it probably results from an excessive secretion of 5-hydroxytryptamine. This substance, also called enteramine, has been found in normal intestinal mucosa (Dalgliesh et al. 1953). It is present in normal serum and blood-platelets and, because of its vasoconstrictor properties, has been called serotonin (Rapport 1949). Lembeck (1953) showed that extracts of a benign argentaffinoma contained hydroxytryptamine, and recently Pernow and Waldenström (1954) have demonstrated very large amounts of this substance in the serum of two patients suffering from metastasising argentaffinoma with vasomotor skin changes.

The action of hydroxytryptamine in man has not yet been completely elucidated. It certainly causes contraction of the smooth muscle of the intestine, and in case 1 the diarrhœa was associated with radiological evidence of excessive peristalsis remote from the site of the tumour. Reid and Rand (1952) have shown that hydroxytryptamine injected intradermally causes local congestion and venous spasm, and probably this would explain the skin colour in case 1. Woolley and Shaw (1954) believe that hydroxytryptamine has important effects on the central nervous system and that certain psychoses, such as schizophrenia, may be related to an abnormal concentration of this substance: case 1 undoubtedly showed mental changes of a confusional type during the last two weeks of her life.

The cause of the cardiac valve lesions remains obscure. In case 2 the pulmonary vessels were not easily seen during fluoroscopy: possibly hydroxytryptamine causes constriction of these vessels which, if continued long enough, results in permanent stenosis.

Summary

Two cases of malignant argentaffinoma of the intestine with metastases in the liver are reported. One was associated with a peculiar patchy cyanosis, and the other showed pulmonary stenosis and tricuspid incompetence.

The view that this syndrome results from an excessive secretion of 5-hydroxytryptamine by the tumour is discussed.

We wish to thank Dr. A. W. Spence and Dr. R. Bodley Scott for permission to publish these cases, and Prof. J. W. S. Blacklock for his help and advice. We are indebted to Dr. R. Cureton for the necropsy report of case 1.

REFERENCES

Björck, G., Axen, O., Thorson, Å. (1952) *Amer. Heart J.* **44**, 143.
Branwood, A. W., Bain, A. D. (1954) *Lancet*, ii, 1259.
Dalgliesh, C. E., Toh, C. C., Work, T. S. (1953) *J. Physiol.* **120**, 298.
Isler, P., Hedinger, C. (1953) *Schweiz. med. Wschr.* **83**, 5.
Lembeck, F. (1953) *Nature, Lond.* **172**, 910.
Pernow, B., Waldenström, J. (1954) *Lancet*, ii, 951.
Rapport, M. M. (1949) *J. biol. Chem.* **180**, 961.
Reid, G., Rand, M. (1952) *Nature, Lond.* **169**, 801.
Thorson, Å., Björck, G., Björkman, G., Waldenström, J. (1954) *Amer. Heart J.* **47**, 795.
Woolley, D. W., Shaw, E. (1954) *Brit. med. J.* ii, 122.

"It may be that the next development of 'communications theory' will be in the heart of the cell, where 'information' seems to flow steadily from the genes to the functional and productive divisions of the cell, through chains of patterned macromolecules; no doubt the inevitable 'feedback' controls are similarly mediated. In many ways the most effective way of picturing the activity of the influenza viruses, and perhaps of many other viruses, is to think of them as a set of punch-cards maliciously inserted into vital parts of a fantastically complicated computing machine. An essential part of the machine's activity is to produce, also in the form of punch-cards, new programmes for its own functioning. Something analogous to virus action would result when the machine found itself compelled to produce programmes that would lead inevitably to its malfunction or destruction."—Sir MACFARLANE BURNET, F.R.C.P., F.R.S. *Endeavour*, 1955, **14**, 5.

SPONTANEOUS HYPOGLYCÆMIA DUE TO ISLET-CELL TUMOUR OF THE PANCREAS

T. A. GRIMSON
M.D. Lond., M.R.C.P.
CONSULTANT PHYSICIAN, DURHAM GROUP OF HOSPITALS

JOAN YELL
M.B. Durh.
MEDICAL REGISTRAR, DRYBURN HOSPITAL, DURHAM

LOCALISED islet-cell tumours of the pancreas are grouped by Whipple (1944) into four groups: (1) typically adenomatous; (2) less well differentiated, with cells in ribbons, or scattered collections with degenerated fibrous tissue; (3) poorly differentiated, with possible malignancy and invasion of the capsule; and (4) definitely malignant, with lymph-node and other metastases.

They are usually found in the body or tail of the pancreas, often deep-seated, and are described as reddish-purple in colour. They are generally amenable to operation, but occasionally numerous adenomata of the islet cells are found diffusely scattered throughout the pancreas, and in these cases surgical removal is impracticable.

Case-report

A man, aged 58, first attended hospital as an outpatient on Oct. 3, 1953, complaining of pain in the right wrist, which subsequently proved to be the site of early rheumatoid arthritis. On entering the consulting-room in the outpatient clinic he staggered about as though drunk and was sweating slightly. His wife, who was with him, said that for about two years he had had frequent episodes of this nature, which had recently been investigated elsewhere and diagnosed as hypertensive encephalopathy. The possibility of hypoglycæmia was considered, and his blood-sugar level was immediately determined as 23 mg. per 100 ml. Oral glucose was administered; two hours later his blood-sugar level was 30 mg. per 100 ml., and he was still behaving as though drunk. He was then given intravenous glucose, and at once his behaviour became normal. He was admitted for investigation the same day, with a tentative diagnosis of islet-cell tumour of the pancreas. Questioning revealed that the attacks usually occurred two or three hours after a meal or after exercise. The patient became confused and did not know what he was doing; he made the spontaneous remark that he always recovered after a meal or if he was given a cup of sweet tea.

Treatment.—He was given a diet liberal in carbohydrate and had no attacks as long as this was continued.

Laboratory Investigations.—A glucose-tolerance test (three days after admission) gave the following blood-sugar levels: fasting 15 mg. per 100 ml., $^1/_2$ hr. after 50 g. of glucose 85 mg. per 100 ml., 1 hr. after glucose 77 mg. per 100 ml., $1^1/_2$ hr. after glucose 58 mg. per 100 ml., 2 hr. after glucose 38 mg. per 100 ml., and $2^1/_2$ hr. after glucose 25 mg. per 100 ml. Neither glycosuria nor ketonuria was found. The blood-urea level was 42 mg. per 100 ml. Liver-function tests gave the following results: serum alkaline phosphatase 13 King-Armstrong units; serum-proteins 7·6 g. per 100 ml. (albumin 4·2 g. per 100 ml., globulin 3·4 g. per 100 ml., albumin/globulin ratio 1·2 : 1); thymol turbidity 1 unit; thymol flocculation negative; prothrombin-time 10 sec.; and urinary excretion of 17-ketosteroids 7·9 mg. in 24 hr.

Laparotomy was done by Mr. R. Petticrew on Nov. 10, 1953. A hard nodule was felt at the junction of the body and the tail of the pancreas, and this proved to be a well-encapsulated whitish tumour, which it was thought might possibly be malignant because of its colour and consistence. For this reason partial pancreatectomy was done, together with splenectomy, and the tumour was sent for histological examination. Dr. J. E. Ennis reported as follows: "Specimen consists of the tail and body of pancreas, 6 cm. long. In the middle of this tissue is a firm white well-defined oval tumour 15 × 11 × 9 mm. Histological examination shows a scirrhous tumour in which there are groups of pancreatic cells, some with acinar arrangement. The nuclei of these cells are somewhat irregular, but mitotic figures are scanty, and there is no obvious invasion of blood-vessels. There is no definite capsule present. Presumably a benign pancreatic islet-cell adenoma." Sections of the tumour were also referred to a consultant panel in morbid histology, who agreed that the tumour was benign.

Postoperative Progress.—Two hours after operation the blood-sugar level was 330 mg. per 100 ml., and it fluctuated between 200 mg. and 650 mg. per 100 ml. for the rest of the day, requiring control with insulin. A week after the operation the fasting blood-sugar level was 175 mg. per 100 ml., and it then settled down to about normal. A glucose-tolerance test on Dec. 3, 1953, gave the following blood-sugar levels: fasting 100 mg. per 100 ml., $^1/_2$ hr. after 50 g. of glucose 175 mg. per 100 ml., 1 hr. after glucose 175 mg. per 100 ml., $1^1/_2$ hr. after glucose 150 mg. per 100 ml., and 2 hr. after glucose 150 mg. per 100 ml. This suggested a low secretion of insulin because the blood-sugar level did not return to normal after two hours. Neither glycosuria nor ketonuria was found.

Follow-up.—The patient was seen as an outpatient on Jan. 6, 1954, when he was feeling well, and again on Feb. 3, when a glucose-tolerance test gave the following blood-sugar levels: fasting 120 mg. per 100 ml., $^1/_2$ hr. after 50 g. of glucose 190 mg. per 100 ml., 1 hr. after glucose 190 mg. per 100 ml., $1^1/_2$ hr. after glucose 200 mg. per 100 ml., 2 hr. after glucose 130 mg. per 100 ml., and $2^1/_2$ hr. after glucose 130 mg. per 100 ml.—i.e., a curve just higher than normal, suggesting minor insulin deficiency. Neither glycosuria nor ketonuria was found. In February he returned to work at the coal-face, after being unemployed for more than two years. Seen on Aug. 13 he was very fit and working regularly; there had been no hypoglycæmic attacks since before his operation, and a glucose-tolerance test gave the following blood-sugar levels: fasting 90 mg. per 100 ml., $^1/_2$ hr. after 50 g. of glucose 178 mg. per 100 ml., $1^1/_2$ hr. after glucose 115 mg. per 100 ml., and 2 hr. after glucose 85 mg. per 100 ml.

Comment

The interesting feature in this case was the unusual appearance of the tumour. These adenomata have invariably been described in published reports as reddish-purple; this one was white, leading to a presumptive diagnosis of malignant adenoma and the removal of more pancreas than would otherwise have been removed, with the result that the patient became severely hyperglycæmic after the operation.

Our thanks are due to Mr. R. Petticrew, F.R.C.S., for the operation, and to Dr. J. E. Ennis for the histological report.

REFERENCE

Whipple, A. O. (1944) *Surgery*, **16**, 289.

Preliminary Communication

EXCRETION OF ETHANOLAMINE-PHOSPHORIC ACID IN CŒLIAC DISEASE

IN the past three years we have examined by paper-partition chromatography the urine of 53 children with cœliac disease. We report here an observation which we believe has not so far been recorded.

In 30 of these children a substance was detected in the urine which corresponded to the position reported for ethanolamine-phosphoric acid.[1] No spot was found for ethanolamine, nor was any other constant abnormality noted in the urine. The diagnosis of cœliac disease was established by the characteristic history and clinical appearance and was supported by the customary investigations. The substance was detected in the urine as early as 3 months and as late as 12 years of age; it was present intermittently regardless of diet, other forms of treatment, or the stage of the disease.

The demonstration of an amino-acid in the position of ethanolamine-phosphoric acid in the urine of children with symptoms suggestive of cœliac disease may be of help in diagnosing the disorder. Should this substance prove to be ethanolamine-phosphoric acid, further light may be shed on the mechanism of the disease; ethanolamine-phosphoric acid has been recovered from the small intestine of rabbits and pigs.[2]

1. Dent, C. E. *Biochem. J.* 1948, **43**, 169.
2. Colowick, S. P., Cori, C. F. *Proc. Soc. exp. Biol., N.Y.* 1939, **40**, 586.

In these three years a total of 709 urinary amino-acid chromatograms from 606 patients have been completed. 225 of the patients were adults (124 men, 101 women); 381 were children below 13 years of age (154 boys, 152 girls, 75 sex not recorded), and 102 of the children were less than 1 year of age.

In addition to the 30 proven cases of cœliac disease, 16 patients were found to have a similar urinary amino-acid chromatogram containing the substance corresponding to ethanolamine-phosphoric acid. 5 were infants, less than 1 month of age, of whom 4 had erythroblastosis fœtalis; of these 4, 3 received an exchange transfusion and 1 subsequently developed obstructive jaundice. The 5th infant had failed to thrive and had had loose motions. Only 1 was an adult—a man, aged 42, who died following obstructive jaundice.

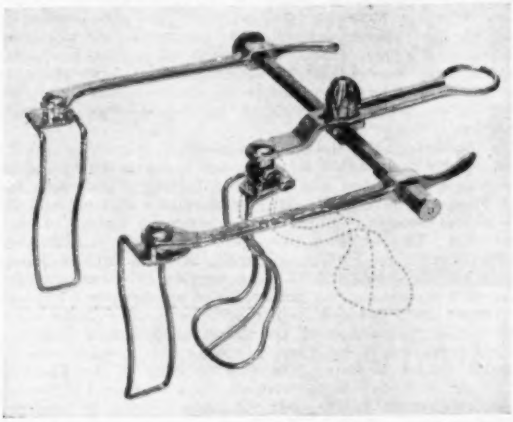
3 were siblings of children with cœliac disease, and a further 4 were suspected of having cœliac disease but lacked laboratory confirmation or adequate investigation. 1 child was dwarfed and had "lienteric" diarrhœa; 1 infant began to vomit and failed to thrive at 9 months of age; and a girl aged 8 years who had had repeated fractures refused further investigation regarding steatorrhœa.

O. D. FISHER
M.D. Lond., M.R.C.P., D.C.H.
Lecturer in Child Health
D. W. NEILL
M.Sc. Lond., A.R.I.C.
Senior Scientific Officer
Department of Child Health, Queen's University, and Biochemical Laboratory, Royal Victoria Hospital, Belfast

New Inventions

A MODIFIED MORSON BLADDER RETRACTOR

MANIPULATION inside the bladder is often made difficult by the posterior wall falling forward. The illustration shows a modification of the Morson bladder retractor which gets over this difficulty. In the standard model, the middle blade moves in two planes only—namely, forwards and backwards and from side to side; but by having a ratchet put in where this blade joins



its shaft, it can be swung through quite a large arc (shown in dotted lines) and the posterior wall of the bladder can be retracted well out of the way.

In stout subjects the Morson retractor seldom lies snugly, and it may become misplaced or even fall out of the bladder cavity. With the modified instrument, the middle blade can be acutely angled so as to prevent this happening. Where the bladder is large and lax, better retraction can be obtained by placing a swab behind the blade, between it and the bladder wall.

This modified version of the Morson retractor was made for me by the Endoscopic Instrument Company, Ltd., London.

MAURICE LEE
M.B. Durh., F.R.C.S.
London, W.1

Reviews of Books

Medicine in its Human Setting

Being Clinical Stories for Students, Nurses and Practitioners. A. E. CLARK-KENNEDY, M.D., F.R.C.P., physician, The London Hospital. London: Faber & Faber. 1954. Pp. 276. 13*s.* 6*d.*

HERE is one more "guide to practice"—clinical, original, stimulating, and eminently palatable. It is addressed to students, nurses, and practitioners, and can be read as a set of vivid clinical lectures, describing the onset, symptoms, signs, recognition, management, and course of many common and significant system-diseases and functional disorders. The emphasis is on observation, recognition of clinical pictures, simple remedies, common sense, and humanity. The limits, no less than the scope, of our knowledge and powers are justly indicated. The stories will stand the student in good stead in his finals, if his examiners are the clinicians they should be; and they present an illuminating picture of practice and the practitioner. Anyone intending to go into general practice, and also any new-generation specialist, who wants to know what a good family doctor is asked to do, how he does it, and what help he needs from his hospital, and from his colleagues, will find it here. Flaws are rare: is there really still "no treatment for hypertension" and is not heroin outmoded even for those with secondaries in their bones? The book's value is unquestionable and Miss Treadgold's lively drawings adorn and point the tales.

Hæmatological Technique

E. M. DARMADY, M.D. Camb., F.R.C.P., senior pathologist, and S. G. T. DAVENPORT, F.I.M.L.T., chief technician, Portsmouth and Isle of Wight Area Pathological Service. London: J. & A. Churchill. 1954. Pp. 197. 18*s.*

THIS book is primarily designed as a class book for medical technicians wishing to pass the examinations in the hæmatology section of the Institute of Medical Laboratory Technology. Though it makes no mention of the techniques concerned with blood-groups, which form an important part of the syllabus, it covers all the other techniques and it endeavours, at the same time, to give "a brief explanation of the fundamental mechanisms behind the disease process." Here, however, the difficulties of compression have sometimes defeated the authors, and some of the explanations—e.g., in the section on blood coagulation—are confusing. The various cells met with in blood and bone-marrow films are illustrated by single examples shown on colour plates, which are well done and carefully reproduced. The various hæmatological techniques are fully described and the advantages and disadvantages of each are clearly set out. There are one or two omissions—e.g., the popular method of estimating hæmoglobin by means of a photoelectric instrument—but what is more upsetting is that there are so many evidences of perfunctory proof correction, names wrongly spelt, wrong initials, incomplete sentences, and so on. Such slips are readily corrected by those familiar with the subject, but the book is not designed for them. For the technician, or for the medical student, this first edition is disappointing—the more so because the publishers have shown that it is possible to produce a book with 4 colour plates at a very reasonable price.

Legg-Calvé-Perthes Syndrome

And Related Osteochondroses of Youth. CHARLES WEER GOFF, M.D., assistant clinical professor of orthopædic surgery, Yale University School of Medicine, in association with NED M. SHUTKIN, M.D. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1954. Pp. 332. 77*s.* 6*d.*

Dr. Goff gives us the fruit of some fifteen years' intensive investigation into what is most commonly referred to as Perthes' disease in this country.

Making full use of his training as a physical anthropologist he has endeavoured to assess the type of child who is subject to this disease. Following Keith and Arey he classifies epiphyses into three sorts: pressure, traction, and atavistic.

He considers that only the first variety—i.e., those involved in joints—are liable to "true osteochondroses," and he refers to such lesions as Schlatter's disease of the tibial tubercle or Sever's apophysitis of the os calcis as "false osteochondroses." The latter group is seen in normal well-grown children, but "true osteochondroses occur in a genetically conditioned individual with evidence of depressed growth before and after onset." The condition is more or less restricted to the White and Mongoloid races, and in over 20% of his 103 cases there was a definite hereditary factor.

As far as immediate ætiology is concerned, he cannot go further than say that "the fundamental pathogenesis in the osteochondroses and in L.C.P.S. in particular is an occlusive vascular phenomenon resulting in bone necrosis." Whereas trauma is the essential factor in the false osteochondroses, he feels that it is no more than a common precipitating cause of the appearance of Perthes' disease. He believes that the hip escapes this disease before the age of two because it is only at that age that full extension of the joint with resulting increased liability to strains is acquired. He describes the treatment on a frame which he follows at Newington and suggests that there may be a future for growth-promoters; he has tried aureomycin in this connection with, he believes, some improvement in his results. He does not mention the lipoid dystrophies in connection with the ætiology of Calvé's disease of the spine, which he looks on as a true osteochondrosis.

This is a thorough and painstaking piece of work, beautifully produced. It is not always easy to read, however; the text would gain greatly if short words replaced those apparently chosen for their length.

Fundamentals of Psychoanalytic Technique

TRYGVE BRAATØY, M.D., late head of the psychiatric department, Ullevål General Hospital, Oslo. New York: John Wiley. London: Chapman & Hall. 1954. Pp. 404. 48*s*.

THE late Dr. Braatøy was primarily concerned, in this book, with psycho-analytic technique from what might be called the amateur's standpoint—as a means of investigating and understanding the patient developed to the level of an art.

Braatøy was born in Minnesota, of Norwegian parents, obtained his medical training in Oslo, and then studied in Paris and at the Psycho-analytical Institute in Berlin under Dr. Otto Fenichel. He later returned to the United States, and this book was written while he was training analyst at Topeka. He thus had an unusually varied background and analytic training. His approach was predominantly psychosomatic, and his general medical interest in his patients' bodily symptoms was obviously one of his main therapeutic weapons—a feature in which he greatly resembles the young Wilhelm Reich. He is well grounded in orthodox Freudian psycho-analysis, but his refusal to be limited by what he regards as unnecessary shibboleths enables him to supply a useful corrective to the too-cerebral approach of some orthodox analysts. These, indeed, may demur at some of his views, but they and all psychotherapists must find much to sympathise with, or to make them think anew.

Every good physician will enjoy this book for its warm humanity.

Stellate Ganglion Block

Techniques–Indications–Uses. DANIEL C. MOORE, M.D., director, department of anesthesiology, Mason Clinic, Seattle. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1954. Pp. 280. 75*s*.

IN this monograph dealing exclusively with the stellate ganglion and its infiltration by anæsthetic agents, the anatomical variations of the ganglion are well illustrated with full-scale drawings, and its physiology is colourfully, if sketchily, mentioned.

Probably the most satisfactory chapter deals with the injection technique for stellate-ganglion block; the methods used by Dr. Moore are clearly presented and he also describes—perhaps with unnecessary generosity—33 alternative methods. He states that some fifty diseases are benefited by single or repeated stellate-ganglion blocks; but he does not present adequate experimental evidence for this, and few people in this country would accept it as satisfactory therapy for scleroderma, thrombo-angiitis obliterans, hyperhidrosis, livedo reticularis, or the cervical-rib syndrome—to name only a few of the conditions mentioned. Indeed the indications for stellate-ganglion block are extremely few, and probably the hard core of this monograph could have been more satisfactorily presented in a short paper.

The Lowenfeld Mosaic Test

MARGARET LOWENFELD, M.R.C.S. London: Newman Neame. 1954. Pp. 349. 144 coloured test cards. 50*s*.

To Dr. Lowenfeld belongs the credit of having first described the technique now known as play therapy, used for the diagnosis and treatment of the psychological disturbances of children. With her mosaic test she must have been one of the first to employ the technique of "projection," but she has only now made available a full account of her material and her own particular application of the method. It is perhaps misleading to call any projection technique a "test"; and certainly, in Dr. Lowenfeld's hands, the mosaic material goes further in diagnostic and therapeutic procedures than any mere test. The phenomena to which she calls attention are of great psychological interest, but the reader may not feel sure that she has established every one of her conclusions. He may also be disappointed that the book does not give him more help in using the "test" for himself.

The book is well produced and it is accompanied by 144 coloured reproductions. To have these separated from the text is not particularly convenient, but since different combinations of them—twenty or thirty at a time—are needed to illustrate each chapter it is hard to see what better solution could be found.

The Story of Medicine (London: Hutchinson. 1954. Pp. 343. 21*s*.).—This history of medicine, written for the layman by Mr. Kenneth Walker, F.R.C.S., will be read with interest, for it is well written and well illustrated. The art of the doctor has always had a fascination for the public, and some of the greatest contributions to medicine have been made by amateurs. Many striking examples of this are given. Leeuwenhoek, the Dutch draper, saw through his home-made microscope what no other man had ever seen before, a whole new world of micro-organisms. Lady Mary Wortley Montagu, the wife of our ambassador to Turkey, did pioneer work for the prevention of smallpox. The Rev. Stephen Hales, by means of ingenious animal experiments, threw light on blood-pressure. Elsewhere in the book the clergy are shown in unfavourable light, for they often used their pulpits in an attempt to stifle progress.

In the first part of the book the medical discoveries and the men chiefly responsible for them are given in chronological order as a connected and sweeping history; but, with the rise of specialisation, Mr. Walker abandons this method for a series of excellent chapters recounting the history of each specialty. This unfortunately makes his story a little confusing, for we read of blood-banks, isotopes, and radiology before we read of anæsthesia and antisepsis. Even more oddly, Pasteur's experiments on immunisation are described 70 pages before we reach those on Jenner, and the work of Lister comes before the recognition of the cause of puerperal infection which preceded it by twenty years. The reader will be shocked here and there. There is the story of how blankets and handkerchiefs infected with smallpox were used to destroy North American Indians—an undoubted form of bacteriological warfare. He may also be left wondering whether some of our current therapeutic methods may not be pilloried in future histories of this type.

Whitaker's Almanack 1955 (London: Whitaker. Pp. 1190. 15*s*.).—This year's issue is as big as last year's and likewise has sixteen pages of photographs, the Royal tour taking the place of the Coronation. Two photographs show Dr. Roger Bannister winning a mile race in less than four minutes at Oxford and at Vancouver. There is a new section on Civil Defence, and new tables show the revenue and expenditure of Scotland separately from those of England; but otherwise this invaluable compendium is much the same, and those engaged in a race for factual information can count on reaching the right page in considerably less than four minutes.

New sublingual/sublabial tablets

SUBLINGS *for the administration of Methyltestosterone or DOCA*

In Sublings the active principles are incorporated in an inert water-soluble, wax base which ensures that the tablets are readily dissolved and the hormone totally absorbed. Their smoothness of texture eliminates oral soreness and their agreeable flavour encourages retention in the mouth.

- **COMPLETE HORMONE ABSORPTION**
- **IDEAL SURFACE AREA**
- **ECONOMICAL**
- **PLEASANT**

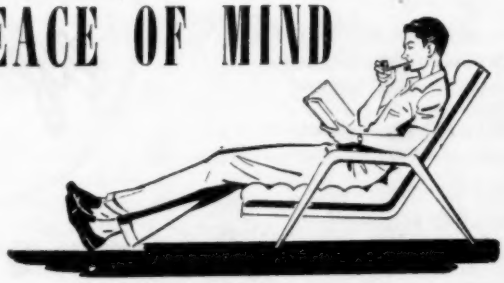
Literature on request.

SUBLINGS METHYLTESTOSTERONE
Tablets containing 5, 10, 25 or 50 mg. methyltestosterone; supplied in bottles of 25, 100 and 500.

SUBLINGS DEOXYCORTONE ACETATE (DOCA)
Tablets containing 1 mg. deoxycortone acetate; supplied in bottles of 25, 100 and 500.

ORGANON LABORATORIES LTD
BRETTENHAM HOUSE, LANCASTER PLACE, W. C. 2
Telephone : TEMple Bar 6785-6-7, 0251-2 Telegrams : Menformon, Rand, London

PEACE OF MIND



induced by 'PULVULES'* **'DEXYTAL'**

'Sodium Amytal,' 1 grain two or three times daily, has an accepted place in the treatment of the depressive and anxiety neurotic. The patient who needs in addition the elevation of mood which can be obtained from dexamphetamine will often benefit greatly from the combined treatment now available in 'DEXYTAL.'

One capsule of 'DEXYTAL' taken two or three times daily will often prevent the periodic breakdown of the chronic depressive patient. 'DEXYTAL' is of especial value where the underlying cause cannot be removed—enabling such patients to face their difficulties with greater insight and cheerfulness.

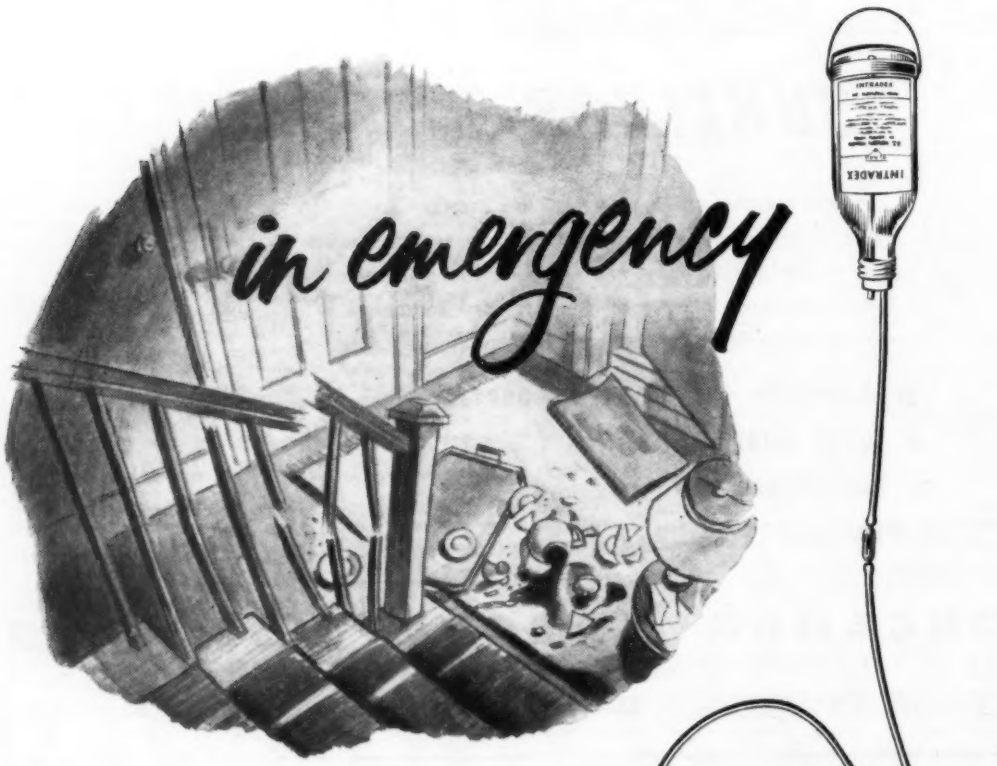
* TRADE MARK

FORMULA: Each capsule contains 65 mg. (1 gr.) 'Sodium Amytal' brand sodium amylobarbitone and 5mg. dexamphetamine sulphate.

PACKING: 'DEXYTAL' 'Pulvules'* are available in bottles of 40, 100, 500 and 5,000.

Lilly TRADE MARK ELI LILLY AND COMPANY LIMITED · BASINGSTOKE · HANTS

29



As you can imagine, the accident pictured here resulted in severe haemorrhage, shock, and multiple fractures. It was a clear case for *immediate* blood volume restoration . . . just one more occasion when INTRADEX saved the day.

This blood volume restorer can be given *at once* without awaiting cross-matching—no risk of incompatibility. INTRADEX is retained in the circulation long enough to counter the shock crisis, being ultimately fully eliminated.

As a blood volume restorer INTRADEX is a complete replacement for plasma. It is also given in emergency cases ultimately needing whole blood. It is sterile, non-pyrogenic, and non-toxic.

GLAXO **INTRADEX**

Trade mark

BLOOD VOLUME RESTORER

6% solution of DEXTRAN *in normal saline; also in 'salt free' form. 540 cc. bottles.*

GLAXO LABORATORIES LIMITED, GREENFORD, MIDDLESEX BYRon 3434

THE LANCET

LONDON: SATURDAY, FEB. 12, 1955

Pharmacology of Chlorpromazine

CHLORPROMAZINE has been the cause of lively controversy since its introduction into therapeutics in 1951.[1 2] Largely this is because some investigators seized on the unusual properties of this drug to sustain hypotheses of their own making. Thus LABORIT,[1 2] who had long been seeking a pharmacological method of producing complete autonomic blockade during surgical anæsthesia, hailed chlorpromazine as a neurovegetative disconnector. DECOURT [3] studied the actions of chlorpromazine in many species in the animal and vegetable kingdom and reported that it had a unique mode of action, to which he gave the name "narcobiotic." Some of the early clinical investigators described imprecisely the changes induced by the drug. Thus it was said to cause "chemical lobotomy" or "chemical adrenalectomy"; and much was made of its supposed specific effect against an undefined symptom, "tension."

One action of chlorpromazine that is now well understood is its antagonism to naturally occurring neurohormonal substances. Chlorpromazine has little antagonism to histamine,[4–6] acetylcholine,[4 6–8] noradrenaline,[4–7 9] or cholinesterase [4]; but by contrast it shows powerful antagonism to adrenaline.[4–7 9–11] It has little or no ganglion-blocking activity.[5 7 8 10] In these respects it resembles dibenamine [7] and other adrenolytic compounds. This powerful specific adrenolytic action of chlorpromazine may account for its ability to protect against traumatic and hæmorrhagic shock; for dibenamine, phentolamine, and other adrenolytic compounds are very effective—just as chlorpromazine is—in preventing shock produced experimentally in animals.[12] Much uncertainty might be dispelled by repeating with other adrenolytic drugs the laboratory and clinical experiments undertaken with chlorpromazine. There is no reasonable doubt that chlorpromazine exerts central effects. When this drug is added to a slice of brain in a Warburg flask the oxygen consumption of the brain cells is reduced.[4 13] This is significant, but the same thing happens with many drugs which apparently lack the other actions of chlorpromazine. If a conditioned reflex is induced in rats by teaching them to climb a rope on the ringing of a bell, the administration of chlorpromazine leads to a state where the stimulus of ringing the bell no longer produces the response.[4] But not all the nervous pathways traversed by this reflex are known, and the site and mode of action cannot be deduced. The effects of chlorpromazine can be studied on other reflex arcs, the anatomical pathways of which are more accurately known. For example, chlorpromazine may sometimes cause hypotension in man [14]; and similarly in animals, if the central end of the cut vagus is stimulated the blood-pressure rises, and this rise can be prevented by prior administration of chlorpromazine.[4 15] This blocking effect may be due to the peripheral adrenolytic properties already described, or it may represent a true central effect. The arguments for central action have been strengthened by evidence that chlorpromazine lowers blood-pressure when administered in amounts that do not block the pressor effects of adrenaline. The injection of minute doses intracisternally into rhesus monkeys causes a fall of blood-pressure and blockade of the carotid pressor reflex, whereas the pressor response to the systemic injection of adrenaline remains unaffected.[15] Granted that this hypotensive action is "central," what is its precise site and mechanism? The hypothalamus and medulla of the cat are known to contain areas direct or reflex stimulation of which produces a rise of blood-pressure.[16] If these areas are stimulated in the decorticate cat to which chlorpromazine has been administered in a dose too low to exert a peripheral adrenolytic effect, there is no pressor response.[15] This seems to indicate that chlorpromazine can depress the activity of hypothalamic and medullary centres with specialised autonomic activity; but the effect can be demonstrated only in conditions so grossly unphysiological that it would be unjustifiable to infer that it reflects events when the drug is administered clinically.

There is need for more detailed characterisation of the central effects of chlorpromazine, perhaps along the lines successfully pursued in the investigation of reserpine [17]; and reports of such work are beginning to appear.[18] A second need is for the clinician to become his own pharmacologist, defining precisely the effects of the drug. There are welcome signs from controlled clinical trials of chlorpromazine in psychiatric patients [19 20] that the psychiatrist is aware of this need. The problems of the pharmacology of a drug are partly the problems of the physiology of the tissues where it acts, and much of our uncertainty about the actions of chlorpromazine stems from imperfect knowledge of the integration of the central nervous system.

Nutritional Cirrhosis

THERE are several reasons for suspecting that uncomplicated nutritional deficiency is not alone responsible for the high incidence of hepatic cirrhosis in many malnourished communities. The correlation between cirrhosis and malnutrition is not as close as would be expected from observations in laboratory animals. The state in animals is not strictly comparable with that in man; for, whereas in animals on deficient diets the distribution of fat is centri-

1. Laborit, H., Huguenard, P. *Pr. méd.* 1951, **59**, 1329.
2. Laborit, H., Huguenard, P., Alluaume, R. *Ibid*, 1952, **60**, 206.
3. Decourt, P. L. *Thérapie*, 1953, **8**, 846.
4. Courvoisier, S., Fournel, J., Ducrot, R., Kolsky, M., Koetchet, P. *Arch. int. Pharmacodyn.* 1953, **92**, 305.
5. Reuse, J. J. *C.R. Soc. Biol., Paris*, 1954, **148**, 192.
6. Kopera, J., Armitage, A. K. *Brit. J. Pharmacol.* 1954, **9**, 392.
7. Huidobro, F. *Arch. int. Pharmacodyn.* 1954, **98**, 308.
8. Decourt, P. L., Brunaud, M., Brunaud, S. *C.R. Soc. Biol. Paris*, 1953, **147**, 1602.
9. Foster, C. A., O'Mullane, E. J., Gaskell, P., Churchill-Davidson, H. C. *Lancet*, 1954, ii, 614.
10. Holzbauer, M., Vogt, M. *Brit. J. Pharmacol.* 1954, **9**, 402.
11. Vanlerenberghe, J., Robelet, A., Milbled, G. *Arch. int. Pharmacodyn.* 1954, **98**, 421.
12. Levy, E. Z., North, W. C., Wells, J. A. *J. Pharmacol.* 1954, **112**, 151.
13. Peruzzo, L., Forni, R. B. *Pr. méd.* 1953, **61**, 1463.
14. Rea, E. L., Shea, J., Fazekas, J. F. *J. Amer. med. Ass.* 1954, **156**, 1249.
15. Dasgupta, S. R., Werner, G. *Brit. J. Pharmacol.* 1954, **9**, 389.
16. Werner, G. *Ind. med. Gaz.* 1953, **88**, 111.
17. Tripod, J., Bein, H. J., Meier, R. *Arch. int. Pharmacodyn.* 1954, **96**, 406.
18. Das, N. N., Dasgupta, S. R., Werner, G. *Ibid*, 1954, **99**, 451.
19. Elkes, J., Elkes, C. *Brit. med. J.* 1954, ii, 560.
20. Anton-Stephens, D. *J. ment. Sci.* 1954, **100**, 543.

lobular, in patients with kwashiorkor it is periportal; and such patients, unlike malnourished animals, are resistant to choline and methionine. The inadequacy of malnutrition as a full explanation of the gross variation between hepatic disease in different parts of the world is especially well illustrated in a report by WALTERS and WATERLOW [1] on fibrosis of the liver in West African children in the Gambia.

A survey of the food habits of the people in this area leaves no doubt that malnutrition is a major factor in their lives; their daily calorie intake ranges from 1570 in April to 1980 in December—shortly after the rice harvest, when the daily intake of protein (almost entirely of vegetable origin) does not exceed 50 g. Fatty infiltration of the liver was not common at any of the ages studied—namely, from early infancy to 20 years. The prevalent hepatomegaly could not, therefore, be attributed to fatty infiltration; and since the incidence of fibrosis in the symptom-free group of children with hepatomegaly was about the same as in the control group without hepatomegaly there is no justification for regarding this hepatomegaly as a precursor of cirrhosis, comparable with the large fatty liver in the rat. From the low prevalence of fatty infiltration of the liver, in contrast to findings elsewhere—for example, by WATERLOW [2] in the West Indies—it must be concluded that the diet, despite its obvious deficiences in both quality and quantity, was not lacking in lipotropic factors. Positive toxic agents, such as bush teas, which are at present suspected as the cause of the peculiar type of fibrosis reported from the West Indies by HILL et al.,[3] do not seem to be involved. But the exceptionally high incidence of parasitic infestation demands attention. Malaria, which affects 62% of infants in their first year, almost every child by the age of three, and 20% of adults, is undoubtedly the most serious form; but helminth infestation runs it close. The rôle of malaria in the genesis of cirrhosis has long been debated; and, although there is no convincing evidence that it can itself cause cirrhosis of the Laennec type, many competent observers have reported increased portal cellularity and portal fibrosis for which no other cause could be found. WALTERS and WATERLOW point out that this type of hepatic fibrosis was especially common in the Gambia in the first few years of life, when the incidence of malaria is at its peak; and they are inclined to accept a causal relationship. With regard to the diffuse type of fibrosis, which resembles Laennec cirrhosis much more closely, the relationship with malaria is less evident; in the age-group in which this form of fibrosis is common, the incidence of malaria has fallen considerably. If the relatively low intensity of malarial infestation in these older children and adolescents induced the fibrosis, then this should have a far wider geographical distribution corresponding to that of endemic malaria.

Neither malnutrition nor malaria, therefore, can be held to account for the severe hepatic fibrosis in the older Gambian children. But it is conceivable that what neither does alone may be done by both together; and WALTERS and WATERLOW suggest that in fact, at least in the Gambia, the combination of malaria and malnutrition accounts for the cirrhosis. In support of this hypothesis they recall the controversy as to whether the primary lesion in cirrhosis involved the parenchyma or the connective tissue. They suggest that malaria produces slight damage to the connective tissue, resulting in innocuous scarring; this damaged connective tissue is hypersensitive to stimuli that tend to evoke a fibrogenic response; and slight parenchymal injury, which in an otherwise normal liver would be followed by complete healing, in the malarial scarred liver leads to increase in the pre-existing scar tissue and Laennec cirrhosis. This attractive unifying hypothesis has not yet been substantiated experimentally.

The rarity of severe fatty infiltration of the liver in these Gambian children is noteworthy; in other parts of the world where a similar diet is consumed severe fatty infiltration is common. In the Gambia, unlike the West Indies, the over-all caloric value of the diet is low. This is of the greatest importance, because the requirement of lipotropic agents is closely related to the total caloric intake. In laboratory animals in which the lipotropes are restricted so as barely to suffice to maintain the liver-fat at a normal level, a supplement of sucrose is as deleterious as an isocaloric amount of alcohol [4]; either leads readily to fatty infiltration and cirrhosis. These results of clinical observation and of experiment emphasise the vulnerability of people living on protein-deficient diets. Toxic agents, mild infections, or slight dietary modifications harmless to the liver of the well-nourished may prove catastrophic to the protein-deficient.

Splenic Circulation

THE splenic circulation has been investigated by two methods. The first consists in reconstruction by dissection, injection, and histological examination of spleens removed at operation or necropsy, and the second in transillumination of the living spleen in small animals such as the mouse. Discussion has centred on whether the splenic circulation is "closed" or "open." In the supposed "closed" circulation there is a direct pathway through vessels of various sizes from artery to capillary, venule, and vein, communication with the pulp spaces taking place only through the capillary walls. In the supposed "open" type of circulation the capillaries are thought to open into the pulp spaces and the venules to collect blood from these spaces, perhaps via the intermediation of venous "sinuses" in which movement is irregular. MCNEE [5] and KLEMPERER [6] put forward a compromise hypothesis. This was that capillaries and venules were in direct continuity, but at some point in the junction area "pores" or spaces allowed communication and interchange of cells and plasma between the vessels and the interstices of the pulp. The vascular tree has two unusually constructed areas where this interchange might take place. One is at the so-called "ellipsoids." These are elliptical sheaths surrounding the penultimate part of the terminal arterioles, where the wall is composed of endothelium only and the

1. Fibrosis of the Liver in West African Children. By J. H. WALTERS and J. C. WATERLOW. *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 285. H.M. Stationery Office, 1954. Pp. 71. 8s. 6d.
2. Waterlow, J. C. *Ibid*, 1948, no. 263.
3. Hill, K. R., Rhodes, K., Stafford, J. L., Aub, R. *Brit. med. J.* 1953, i, 117.
4. Best, C. H., Hartroft, W. S., Lucas, C. C., Ridout, J. H. *Ibid.* 1949, ii, 1001.
5. McNee, J. W. *Lancet*, 1931, i, 951.
6. Klemperer, P. *In* Handbook of Hematology, edited by H. Downey. New York, 1938; vol. 3, p. 1587.

diameter is about 5 μ; the capillaries extend only a short distance beyond the ellipsoid. The other likely area is in the splenic sinuses. These form a plexus of anastomosing vessels with peculiar walls, which, according to KLEMPERER, are composed of longitudinally elongated endothelial cells arranged in a ridge-like manner and surrounded by anastomosing reticular loops. Experimental evidence of the existence of "pores" was provided by BJÖRKMAN,[7] who showed that in the rabbit spleen particles of up to a certain size can pass through the blood-vessel walls into the pulp spaces, while larger particles pass on to the veins. If the animal is exposed to infection or to the action of hæmolytic antibodies, particles five times as large get through to the pulp; so the size of the pores varies with circumstances.

Some of the most striking work on this subject was done by KNISELY. From direct transillumination of spleen in the living mouse he concluded that the splenic circulation was entirely closed.[8] Later, MACKENZIE et al.[9] pointed out that observations with KNISELY's technique could equally be interpreted as showing that the circulation was completely open with arterial capillaries opening into the spongework of the splenic pulp, which in turn drained into the venous sinuses. WHIPPLE and his co-workers [10] have now reported results obtained with an improved technique for studying the circulation in the spleen of the living mouse. Their findings suggest that the blood-vessels are connected in several different co-existing ways. The afferent arterioles lined by endothelium are distinguished by the rapid blood-flow through them. Some of them end in curious funnel-shaped ampullæ (originally described by THOMA). The arterioles are linked with capillaries that may either empty directly into the pulp spaces or connect directly with venous channels; in addition some direct arteriovenous anastomoses were observed. The veins collect from the pulp spaces, from the sinuses, and from arterial vessels directly, and they empty in turn into larger collecting veins. WHIPPLE now doubts whether the sinuses exist separately, at least in a functional sense; he thinks that they are simply small venous channels in which the flow is sometimes reversed, so they can drain from or empty into the pulp spaces. The pulp spaces themselves are completely irregular and have no endothelial lining; the blood-flow through these spaces is also irregular; the blood may be stationary for long periods, and the direction of flow changes often; through the spaces the blood-cells appear to wander quite at random. The pulp receives blood from the ampullæ of the arterioles, from capillaries directly, and from veins; it empties into veins. The direction of the blood-flow in the pulp and in the smaller veins depends on blood-pressure differences in the various parts of this intercommunicating system. The flow is also affected by the fact that the larger white cells often block the smaller channels; sometimes the block is only partial, and then plasma and platelets pass but red cells are held back. From these observations WHIPPLE and his colleagues now put forward the diplomatic conclusion that everyone is right—that both "closed" and "open" systems exist side by side in the spleen.

All these experiments were necessarily done on small animals—mice and rabbits. But there is indirect evidence of a similar state of affairs in man. Thus the well-known microscopic appearance of the spleen in congenital spherocytosis shows that the red cells pack the pulp and compress the sinuses; so there must be channels for their egress from the arterial side, while their entry into the veins seems to be less easy. ATKINSON and SHERLOCK [11] have shown that the pressure recorded from a hollow needle passed into the splenic pulp is an index of portal venous pressure; so there must be free intercommunication between the pulp spaces and the portal venous system. The evidence from splenic venography is even more striking. DREYER and BUDTZ-OLSEN [12] pointed out that the injected opaque medium leaves the spleen very rapidly—so rapidly that the first X-ray film must be exposed as the injection is being completed, and a second only three seconds later. This, too, surely signifies free communication between the pulp spaces and the venous outlet, even if there are some "closed" channels as well. DREYER and BUDTZ-OLSEN noticed that injected diodone does not diffuse throughout the whole spleen; it is limited to one "compartment" that drains into one of the hilar splenic veins. The half-dozen or so main branches of the splenic artery do not intercommunicate to any great extent, and this accounts for the liability of the spleen to infarction.

Many hypotheses about the ætiology of diseases associated with splenomegaly assume that, in some of these, blood-cells get out into the pulp and are held there, while in others back-pressure along the splenic veins leads to distension and dilation of the venous passages in the spleen. A mixed closed and open system would allow this sort of thing; and it is useful to have confirmation of such a system from both physiology and pathology.

7. Björkman, S. E. *Acta med. scand.* 1947, **128**, suppl. 191.
8. Knisely, M. H. *Anat. Rec.* 1936, **65**, 23, 131.
9. MacKenzie, D. W. jun., Whipple, A. O., Wintersteiner, M. P. *Amer. J. Anat.* 1941, **68**, 397.
10. Whipple, A. O., Parpart, A. K., Chang, J. J. *Ann. Surg.* 1954, **140**, 266.

Annotations

URINARY EXCRETION OF ŒSTROGENS

IN seeking to differentiate endocrine disorders resulting from hypersecretion or hyposecretion of androgens the clinician can rely on valuable help from the biochemist; but not so with disorders due to abnormal ovarian secretion. In the absence of a practicable chemical method, and conscious of the tedium and uncertainty of biological assay, most clinicians have taken the vaginal smear as a simple, if rough, indication of the events of the œstrous cycle. But now the Edinburgh school, by developing two independent methods for assaying urinary œstrogens,[13 14] have made possible the systematic study of ovarian function. This success is the outcome of herculean effort. During the menstrual cycle the daily urinary output of œstrogen (13–56 μg.) is less than a hundredth of the corresponding androgen level; and the isolation of the three compounds—œstradiol, œstrone, and œstriol—which is a pre-requisite for their determination by the chemical method, represents an over-all purification of one in more than five million.

Biological assay measures total activity but does not identify the compounds contributing to this activity; whereas the chemical methods isolate the known urinary

11. Atkinson, M., Sherlock, S. *Lancet*, 1954, i, 1325.
12. Dreyer, B., Budtz-Olsen, O. E. *Ibid*, 1952, i, 530.
13. Bauld, W. S. *Mem. Soc. Endocrin.* (in the press).
14. Brown, J. B. *Ibid* (in the press).

œstrogens, all of which have different biological activity. If it is assumed that œstradiol, the most active compound, is the genuine hormone, then the determination of the relatively inactive metabolites, œstrone and œstriol, may give a misleading impression. How far such determinations reflect the œstrogenic activity of the endocrine glands is not certain. Comparison of 17-ketosteroid levels in plasma and in urine has revealed substantial differences [15]; these differences imply a degree of selective renal clearance, which has thrown some doubt on the value of urinary 17-ketosteroid determinations as an indication of androgen secretion. From the pattern of œstrogen excretion throughout the menstrual cycle, it is clear that urinary œstrogen levels follow the events of the ovarian cycle remarkably closely. Dr. Brown's study of a representative group of non-pregnant women, reported on p. 320 of this issue, has confirmed the existence of two peaks of excretion, one corresponding with ovulation and the second with maturation of the corpus luteum. All three urinary œstrogens show this cyclic variation, with a sharp drop immediately after ovulation; but the absolute and relative amounts vary considerably between different cases. In competent hands the method is fully reliable; but because of the differences in secretion between different women, and in individual women according to the stage of the cycle, isolated determinations are valueless—and such a determination will represent ten hours of work wasted.

Definition of the normal limits of secretion is a necessary preliminary to the study of abnormal conditions. The opportunities offered by this development are great, but the inherent difficulties should not be forgotten: one microgramme is the twenty-eight millionth part of an ounce.

LUNGS, BONES, AND JOINTS

THE clubbed fingers of Hippocrates are commonly regarded [16] as a localised form of the more widespread "hypertrophic pulmonary osteo-arthropathy" of Bamberger [17] and Marie.[18] Clubbing usually accompanies the bony and soft-tissue changes of hypertrophic osteo-arthropathy, and in some cases of apparently "simple" clubbing radiography of the long bones reveals new subperiosteal bone. Clubbing and ossifying periostitis are often accompanied by symptoms of joint disease. For the whole complex Marie's title can appropriately be altered to "generalised hypertrophic osteo-arthropathy," [19] since the associated systemic disease is not invariably pulmonary. In general the clinical implications of simple clubbing and of the complete picture of hypertrophic osteo-arthropathy are similar, but Hansen [20] found that the latter was particularly likely to develop in patients with a localised lung lesion, such as carcinoma or abscess.

Wierman et al.,[21] at the Mayo Clinic, found finger-clubbing in about 5% of cases of malignant tumours of the lung submitted to resection, and the joints were painful in less than a third of these. Arthralgia without clubbing was rare. Like Ray and Fisher,[22] Wierman et al. found clubbing in a higher proportion of cases of bronchiectasis and lung abscess, but no patient had painful joints. Clubbing was extremely rare in pulmonary tuberculosis. The curious association of articular manifestations with pleural mesothelioma [23] was fully confirmed—arthralgia was the initial and predominant complaint in 7 of the 14 cases of this uncommon tumour. From this analysis it appears that a patient with severe arthralgia which has preceded the development of chest symptoms, or the discovery of symptomless pathological changes in lungs or pleura, is likely to have either a pleural mesothelioma or a malignant pulmonary lesion; and if there is no clubbing of the fingers mesothelioma is the more probable diagnosis. Several workers [24–26] have drawn attention to cases of malignant disease of the lung in which prominent or even presenting features have suggested rheumatoid arthritis (for example, fusiform spindling of the fingers, effusions into joints, and rapid erythrocyte-sedimentation rate) or rheumatic fever. Ray and Fisher found that 10% of cases of carcinoma of the lung had acute osteo-arthropathy, with painful joints as the initial complaint. In nearly all such cases the tumour was at the periphery of the lung.

The pathogenesis of hypertrophic osteo-arthropathy has not yet been satisfactorily explained. It is now generally ascribed to peripheral anoxia or a disturbance of endocrine function rather than the "toxins" of earlier workers. Reduced pulmonary aeration seems unlikely to play a part in those cases of bronchogenic carcinoma where only a small volume of lung is involved—and in which pneumonectomy may rapidly cure the arthropathy. But peripheral arterial anoxia may, as Mauer [27] suggested, be due to alterations in the stability of red-cell suspension. Mendlowitz,[28] having demonstrated an increase in digital blood-flow and a decrease in the brachial-digital arterial pressure in simple clubbing (which was absent when bony changes were present), thought that the clubbing might be a compensatory response to altered circulatory dynamics. No circulatory changes were found in congenital clubbing. In support of dyspituitarism as a causal factor, Fried [29] described four cases in which acromegalic features developed, with hyperplasia of the eosinophilic cells of the pituitary—an observation which recalls the distinction of hypertrophic osteo-arthropathy by separation from acromegaly. The presence of gynæcomastia in some cases is a further hint of altered endocrine function. The regression after lung resection excludes stimulation of the pituitary by metastases within its substance [30] as a common mechanism. The high incidence of arthropathy in pleural mesothelioma and in peripheral lung tumours suggests that the pleura may in some way be concerned. Hansen [20] believed that nervous reflexes from the lung [31] played a part; and he cited the curative effect of hilar neurectomy without lung resection. Finally there remains unexplained the group of cases in which hypertrophic osteo-arthropathy is not accompanied by any demonstrable primary disease.[32] The disease usually starts in boys at puberty or in adolescence, and it tends to progress slowly, producing deformity and sometimes extreme disability. This form is thought to be distinct from hereditary clubbing, in which periosteal proliferation may occur but is never very extensive.

From the work of Gall et al.[19] it seems that generalised hypertrophic osteo-arthropathy is most likely to affect first the distal third of the forearm and leg, next the lower ends of the humerus and femur, and later still the meta-

15. Migeon, C. J., Plager, J. E. *Recent. Progr. Hormone Res.* 1954, **9**, 235.
16. Locke, E. A. *Arch. intern. Med.* 1915, **15**, 659.
17. Bamberger, E. *Wien. klin. Wschr.* 1889, **11**, 226.
18. Marie, P. *Rev. Médecine*, 1890, **10**, 1.
19. Gall, E. A., Bennett, G. A., Bauer, W. *Amer. J. Path.* 1951, **27**, 349.
20. Hansen, J. L. *Acta. med. scand.* 1952, **142**, suppl. 266, p. 467.
21. Wierman, W. H., Clagett, O. T., McDonald, J. R. *J. Amer. med. Ass.* 1954, **155**, 1459.
22. Ray, E. S., Fisher, H. P. *Ann. intern. Med.* 1953, **38**, 239.
23. Clagett, O. T., McDonald, J. R., Schmidt, H. W. *J. thorac. Surg.* 1952, **24**, 213.
24. Craig, J. W. *Brit. med. J.* 1939, i, 750.
25. Van Hazel, W. *J. thorac. Surg.* 1940, **9**, 495.
26. Holmes, H. H., Bauman, E., Ragan, C. *Ann. rheum. Dis.* 1950, **9**, 169.
27. Mauer, E. F. *Amer. Heart J.* 1947, **34**, 852.
28. Mendlowitz, M. *Medicine, Baltimore*, 1942, **21**, 269.
29. Fried, B. M. *Arch. intern. Med.* 1943, **72**, 565.
30. Bloom, W. *Ann. intern. Med.* 1948, **29**, 361.
31. Wyburn-Mason, R. *Lancet*, 1948, i, 203.
32. Camp, J. D., Scanlan, R. L. *Radiology*, 1948, **50**, 58.

carpals and metatarsals—a pattern which should be kept in mind when seeking radiographic confirmation of the diagnosis. Others have reported changes in the clavicle, scapula, patella, iliac crests, nose, and malar eminences. The periosteum, thickened and infiltrated with lymphocytes, lays down new bone matrix on the underlying cortex, especially over extensor surfaces. Tendon insertions undergo metamorphosis into fibrocartilage, which is later replaced by bone forming intratendinous osteophytes. By resorption the original cortex becomes cancellous, and in time can no longer be distinguished from the new subperiosteal bone. In the joints there is chronic synovitis with degenerative changes in the articular cartilage; there may be hypertrophy of villi, and a spreading "pannus" may even form. The subsynovial tissues are œdematous and infiltrated with lymphocytes and plasma-cells. In the terminal phalanges there are only occasional spur-like overgrowths of bone, and the changes are largely confined to the soft tissues. The collagen bundles of the corium are swollen and the extra-osseous tissues infiltrated with round cells. Pain and tenderness in the joints are probably due more to arthritis than to adjacent periostitis.

CARRIAGE OF TUBERCULOUS PATIENTS BY AIR

OUR knowledge of the special problems involved in transporting invalids by air is based largely on hard-won experience in war-time, when air evacuation of casualties was sometimes a tactical necessity as well as a means of saving life. Investigators at that time were particularly interested in the effect of altitude upon traumatic pneumothorax, and their observations have since been turned to good effect in the conveyance by air of tuberculous patients with artificial pneumothorax and pneumoperitoneum. For example, the British Overseas Airways Corporation have since 1951 flown more than 1300 patients to and from sanatoria in Switzerland, and an account of the arrangements on these flights has now been given by Dr. Peffers,[1] assistant director of medical services, B.O.A.C.

Patients with moderately severe pulmonary tuberculosis, who had received little or no previous treatment, were carried on the outward flights. Very advanced cases, cases with severe impairment of lung function, and those with pleural effusion or recent severe haemoptysis were considered unsuitable, either on the grounds that six to twelve months' sanatorium treatment in Switzerland was unlikely to be of much benefit to them, or because the risks of the journey were adjudged too great. Of the patients returning to Britain, some had had artificial pneumothorax or extrapleural collapse, some pneumoperitoneum, and some thoracoplasty; in others the disease had been stabilised, but resection was to be performed at a later date. All the patients were under the care of the Department of Health for Scotland, who were responsible for initiating the project.

The aircraft employed were Argonauts, pressurised at a cabin differential of 4·12 lb. per sq. in. Thus, while they actually flew above the weather at about 15,000 feet, their passengers were subjected to a reduction in oxygen tension and pressure not greater than is experienced at 5000 feet—the altitude of the Swiss sanatoria. This overcame the principal disadvantage of air-travel in these cases, which arises from the fact that air in the pleural or peritoneal cavity obeys Boyle's law, and expansion under reduced atmospheric pressure causes cardiac or respiratory embarrassment, and may result in the tearing of adhesions. It was recommended that patients with pneumothorax or pneumoperitoneum should not be given a refill in the week preceding their flight; and, where mediastinal fixation was suspected, the lung had to be at least three-quarters expanded at the time of travelling. Of the 1300 patients, only 3 showed signs of respiratory or cardiac distress: 1 had a bilateral artificial pneumothorax, and responded well to treatment with a cardiac stimulant and oxygen, while the other 2 recovered quickly with rest.

To prevent air-sickness, all patients were given hyoscine hydrobromide gr. $^1/_{100}$ one hour before take-off. An incidental effect of this drug, and one which in these cases was obviously desirable, was to reduce secretion of sputum. Several oxygen cylinders were carried on each flight in case of emergency, as well as supplies of stimulants and analgesics, and apparatus (sterilised and ready for immediate use) for performing pleural puncture in the event of the pressure in an artificial pneumothorax becoming excessive.

Rigorous precautions were taken to prevent contamination of the aircraft's furnishings and fittings. All food-containers, utensils, and cutlery were destroyed after use; sputum flasks were issued to each patient; wash-hand basins and toilets were disinfected after each flight; and as soon as the passengers had disembarked, the interior of each aircraft was sprayed with 5% formalin, being later washed down with soapy water and a strong disinfectant. Two doctors—one supplied by the Scottish health department and one by B.O.A.C.—were in attendance on each flight, and the stewardesses were required to have hospital nursing experience. All aircrews were volunteers; contact between them and the patients was kept to a minimum, and as an additional safeguard the flight-deck and cabin crews were radiographed at six-monthly intervals.

Thus in these charter flights great care was taken to protect the patient and to prevent spread of infection. Patients with open tuberculosis must not travel on scheduled flights, lest both they and others be exposed to hazard.

HYPERPARATHYROIDISM AND PEPTIC ULCER

SINCE we last discussed the differential diagnosis of hypercalcæmic states in adults[1] two American reports have emphasised the difficulty of distinguishing primary hyperparathyroidism and the syndrome of hypercalcæmic renal failure from excessive intake of milk and soluble alkalis by patients with peptic ulcer.[2] Carpenter and Pautler[3] describe a case in which there was a clear history of excessive milk intake without ingestion of soluble alkalis and without increase of serum-bicarbonate; necropsy showed that the condition was due to a solitary parathyroid adenoma. Kyle[4] compares two apparently similar cases. One of these was a true example of the milk-alkali syndrome; the patient, who is said to have taken up to 3 litres of milk and 226 g. (2700 m.eq.) of sodium bicarbonate daily, died of uræmia, and necropsy revealed severe nephrocalcinosis. In the other case the patient also gave a history of excessive milk and alkali intake, but a calcium-infusion test[5–7] gave a result more suggestive of primary hyperparathyroidism (i.e., an increase rather than the normal fall of urinary phosphate), and complete clinical cure followed removal of a solitary parathyroid adenoma. The co-existence of hyperparathyroidism and symptoms of peptic ulcer in these two cases is not a chance happening. Over twenty years ago Gutman et al.[8] showed that hyperparathyroidism

1. Peffers, A. S. R. *Hlth Bull., Edinb.* 1954, **12**, 59.

1. *Lancet*, 1954, i, 921.
2. Burnett, C. H., Commons, R. R., Albright, F., Howard, J. E. *New Engl. J. Med.* 1949, **240**, 787.
3. Carpenter, H. M., Pautler, E. E. *Ibid*, 1954, **250**, 453.
4. Kyle, L. H. *Ibid*, 1954, **251**, 1035.
5. Howard, J. E., Hopkins, T. R., Connor, T. B. *J. clin. Endocrin.* 1953, **13**, 1.
6. Kyle, L. H., Schaaf, M., Erdman, L. A. *J. Lab. clin. Med.* 1954, **43**, 123.
7. Nordin, B. E. C., Fraser, R. *Clin. Sci.* 1954, **13**, 477.
8. Gutman, A. B., Swenson, P. C., Parsons, W. B. *J. Amer. med. Ass.* 1934, **103**, 87.

was often associated with anorexia, nausea, vomiting, constipation, and epigastric pain, and that the symptoms could easily be confused with those of duodenal ulcer. Rogers et al.[9 10] first described the actual association of the two conditions, and many striking series have since been reported. Howard et al.[11] stated that 15% of all cases of hyperparathyroidism diagnosed at the Johns Hopkins Hospital were complicated by peptic ulceration. Hellström,[12] reporting a series of 50 cases of hyperparathyroidism, pointed out that 5 of the 17 males and 2 of the 33 females had duodenal ulcer. St. Goar [13] has recently described experience at the Massachusetts General Hospital, where, of 137 patients with hyperparathyroidism, 12 had a proved peptic ulcer and a further 5 had very suggestive dyspeptic symptoms. Although hyperparathyroidism is two and a half times as common in females as in males, of the 12 patients with proved peptic ulcer 8 were males and 4 were females. From these reports there is little doubt that the incidence of peptic (usually duodenal) ulceration is greatly increased in males with hyperparathyroidism.

This complication is even more prominent in an uncommon hereditary endocrine disease which includes hyperparathyroidism. Underdahl et al.[14] described 8 patients with multiple endocrine adenomata in the pituitary, parathyroids, and islet cells of the pancreas, 3 of whom also had a peptic ulcer. Wermer [15] describes a family in which the father and 4 of his 9 children were affected; in 4 of these 5 cases peptic ulceration was also present.

Rutishauser and Majno [16] found that injections of large doses of parathyroid extract in normal dogs produced œdema and necrosis with calcification of the deeper portions of the glands of the gastric fundus. Simultaneously there was a sharp rise in serum-pepsinogen levels, indicating increased leakage of the enzyme into the blood-stream. When peptic ulcer complicates hyperparathyroidism, the kidneys are more liable to be affected than the skeleton. Increased calcium intake from the high-milk diet usually prescribed in peptic ulcer tends to prevent excessive demineralisation of bone, but leads to severe hypercalcæmia with nephrocalcinosis or renal calculi. Parathyroidectomy often cures the complicating peptic ulcer as well as the hyperparathyroidism.

CHEMOTHERAPY AND SURGERY IN PULMONARY TUBERCULOSIS

FIFTEEN years ago Dolley and Jones [17] undertook the first deliberate operative removal of tuberculous lung tissue. For a decade thereafter confidence in the procedure steadily increased, but only in the past five years has resection swept into favour. This change, which could hardly have taken place without chemotherapy, has been hastened by dissatisfaction with the older methods of treating some forms of pulmonary tuberculosis—for example, fibrotic bronchial stenosis, destroyed lung, large tension cavity, and tuberculoma.

The hazards of resection have considerably diminished. Francis,[18] reviewing the first 100 partial resections at Harefield Hospital, found that, whereas 90% of patients who had had round foci removed did well, of those with more serious disease only 64% obtained a satisfactory result and no less than 20% developed a bronchopleural fistula. In many of these early cases the patients received no chemotherapy, and others were given less than 20 g. streptomycin. The advantage of adequate chemotherapeutic preparation is reflected in the results lately obtained by Thompson et al.[19] at Sully Hospital: of 266 resections (including 118 pneumonectomies) only 8 (3%) resulted in fistulæ.

Owing to chemotherapy many patients are now submitted to resection with the disease in a state that a decade ago would have been regarded as quiescent; indeed, it becomes more and more difficult, such is the apparent effectiveness of chemotherapy, to decide which cases should be operated on. Such doubts increase when, as sometimes happens, the resected lung shows extremely slight evidence of active disease; even cavities may be converted into apparently inert cysts. Pagel and Simmonds,[20] describing such a case, observe: "The distinguishing feature of the cavity wall is a complete replacement of caseous and tuberculous tissue by fibrous and ordinary granulation tissue, in which foreign body giant cells are conspicuous." Clearly, should such complete healing prove usual and permanent, the scope of surgery in pulmonary tuberculosis would be slight; but, as Pagel and Simmonds point out, incomplete healing must be regarded as the more probable outcome. Consequently, they still advocate collapse or resection for the prevention of relapses, and resection in most cases of cavities that have healed as cyst-like spaces, which may become secondarily infected, distend, or even rupture. In such cases collapse therapy scarcely seems adequate; and, besides, complete healing of cavities can never be diagnosed with certainty before operation.

Present-day thoracic surgery is thus increasingly influenced by chemotherapy. Temporary measures, such as pneumothorax and phrenic paralysis, continue to fall out of favour, but pneumoperitoneum is still quite widely practised as an interim measure and as a supplement to chemotherapy in patients unsuitable for surgery. More resections are being done, but on an increasingly conservative scale, with more segmental resections and fewer pneumonectomies. On the other hand, many clinicians still hold that collapse therapy is safer than resection—though the evidence for this, too, is not as yet conclusive. There is great need for a satisfactory statistical comparison of the two methods [21]; and perhaps the present large-scale investigation of thoracic surgical operations by the British Tuberculosis Association and the Society of Thoracic Surgeons will help to fill this gap.

NEW ANALGESIC

ASPIRIN has given many years of satisfactory service as an analgesic and antipyretic drug. Nevertheless, alternatives have been continually sought. In the manufacture of salicylic acid by what is known as the Kolbe-Schmitt reaction, a "brown dust" is obtained as a residue. One constituent of this is 4-hydroxyisophthalic acid, which has been subjected to preliminary pharmacological study.[22] Acute and chronic toxicity tests in rats and mice show that the substance is not grossly toxic, and it has analgesic properties. Clinical trials are now in progress.

Prof. E. D. ADRIAN, O.M., P.R.S., on whom a barony was conferred in the New Year honours, has chosen the title of Baron Adrian of Cambridge.

9. Rogers, H. M. *Ibid*, 1946, **130**, 22.
10. Rogers, H. M., Keating, F. R., Morlock, C. G., Barker, N. W. *Arch. intern. Med.* 1947, **79**, 307.
11. Howard, J. E., Follis, R. H., Yendt, E. R., Connor, T. B. *J. clin. Endocrin.* 1953, **13**, 997.
12. Hellström, J. *Acta endocr., Copenhagen*, 1954, **16**, 30.
13. St. Goar, W. T. *J. clin. Endocrin.* 1954, **14**, 1569.
14. Underdahl, L. O., Woolner, L. B., Black, B. M. *Ibid*, 1953, **13**, 20.
15. Wermer, P. *Amer. J. Med.* 1954, **16**, 363.
16. Rutishauser, E., Majno, G. *Pr. méd.* 1953, **61**, 286.
17. Dolley, F. S., Jones, J. C. *J. thorac. Surg.* 1939, **8**, 351.
18. Francis, R. S. *Tubercle, Lond.* 1954, **35**, 210, 238.
19. Thompson, H. T., Savage, T., Rosser, T. H. L. *Thorax*, 1954, **9**, 1.
20. Pagel, W., Simmonds, F. A. G. *Tubercle, Lond.* 1955, **36**, 2.
21. See *Lancet*, 1954, **i**, 1066.
22. Chesher, G. B., Collier, H. O. J., Hunt, S. E., Idris Jones, J., Lindsey, A. S., Robinson, F. A., Taylor, E. P. *Nature, Lond.* 1955, **175**, 206.

Social and Biological Factors in Infant Mortality *

I. OBJECTS AND METHODS

J. N. MORRIS
M.A. Glasg., M.R.C.P., D.P.H.

J. A. HEADY
M.A. Oxfd

OF THE SOCIAL MEDICINE RESEARCH UNIT

THIS paper describes the background and plan of an inquiry into the 80,000 stillbirths and infant deaths which occurred among the $1^1/_2$ million children born in England and Wales during 1949 and 1950. The information obtained when these deaths were registered is linked to the information obtained when the children concerned were born. "Biological" factors such as the mother's age and the number of her children, and "social" factors such as the father's social class and occupation, and the part of the country and the type of community in which the birth took place, are thus related to the deaths, to their certified causes, and the ages at which death took place. All these factors are interconnected. Social factors, for instance, act through and upon biological factors, affecting the size of family, the spacing of children, the nutrition of mother and child, and the opportunities for infection. In turn, biological factors—the size of family most obviously—profoundly modify the social situation; moreover, as in the complications of pregnancy or the viability of infants born prematurely, they are differently effective in different situations. Clearly, therefore, the various factors will be better understood in theoretical terms if they are studied together as well as separately. This is necessary on practical grounds, too; since any particular factor, or group of factors, may offer opportunities for preventive action. The present inquiry attempts such a many-sided approach to the problems of infant mortality.

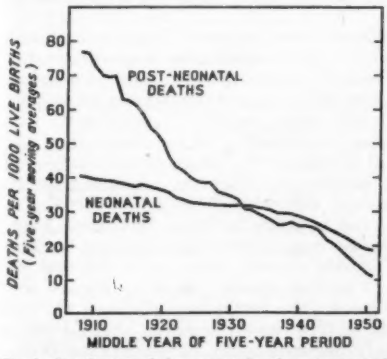


Fig. 1—Secular trends in neonatal and post-neonatal mortality in England and Wales in 1906–53.

"Neonatal" refers to the first four weeks of life, and "post-neonatal" to the rest of the first year. Unless otherwise stated, the diagrams in this paper refer to all births (including multiple, illegitimate, and of both sexes).

* * *

The infant-mortality rate in England and Wales has fallen by four-fifths in the last fifty years, from over 150 per thousand births in 1900 to less than 30 today. The problem of infant death, moreover, is now different in kind as well as in size from what it was at the beginning of the century. Deaths in the *first four weeks of life*—"*neonatal*" deaths—contributed 66% of all infant deaths in 1953; in 1906 (separate figures for the neonatal period are not available before 1906) 68% of the deaths were "*post-neonatal*"—in the *remainder of the first year of life*.[28] Whereas the post-neonatal mortality-rate fell in the period by 90%, the neonatal rate fell by less than 60% (fig. 1). The decline in the infant death-rate after the age of 4 weeks is similar to that in the mortality of young children, generally (fig. 2).

The relatively much more rapid drop in the *post-neonatal* death-rate has been due in large measure to improved infant feeding, and to the reduction of infectious diseases, the main outstanding problems today being infections of the respiratory tract. *Neonatal* mortality, on the other hand, is dominated by "immaturity" of the infant and physiological failures, by injury during birth, by congenital malformation, and by mechanisms leading to "asphyxia" and "atelectasis." These processes are little understood, if at all, and the results of new treatments have been less dramatic. The underlying causes of these deaths in the first month of life, and particularly in the first week (during which the great majority of the deaths in the first month occur), are similar to those of stillbirth; and there is an increasing tendency to consider stillbirths and deaths in the first week as a single problem, such terms as "perinatal" [29] or "obstetric" [9] deaths being used to describe them. With changing problems the emphasis in current research is thus shifting to the antenatal period and the circumstances of the birth, to the study of mother and child together, and to factors which affect the vitality of the child through the mother. Such influences are the more likely to be effective the shorter the infant's life, until, in stillbirths, they must be predominant. It is possible, moreover, that some of the underlying causes of the numerically greater problem of abortion before the 28th week of pregnancy (the arbitrary stage after which the term "abortion" is not officially used) may be similar to those of stillbirths—but even less is known about this problem.

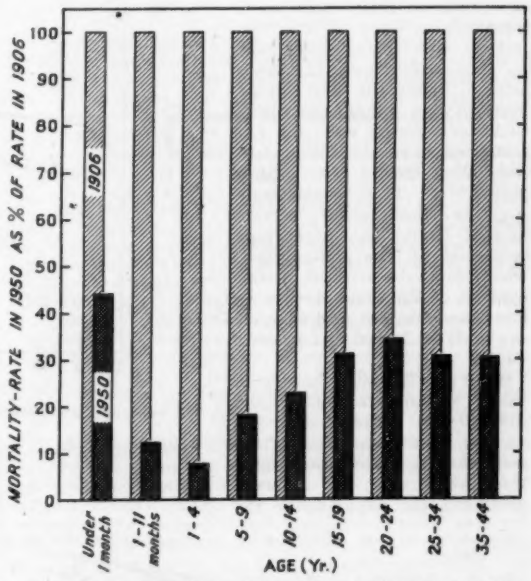


Fig. 2—Decline in mortality at different ages in England and Wales from 1906 to 1950.

Mortality-rates per 1000 live births, in first year; per 1000 persons living, at other ages.

* A series of articles reporting an inquiry made jointly by the Social Medicine Research Unit (Medical Research Council) and the General Register Office. The articles were prepared by the Unit in collaboration with the General Register Office, and have been approved for publication by the joint working party responsible for the inquiry.

Social Factors

It is a commonplace of the study of infant mortality that social influences are at their strongest in the post-neonatal period, related as they are to infection; but it does not follow that their effect on the *stillbirth and neonatal death-rates* is negligible. There is a step-by-step increase in both these rates from social class I to social class V in the scale, based on the occupation of the father, which is used by the General Register Office.[37] † The rates of death attributed to prematurity—one of the most important considerations in perinatal mortality—are similarly affected.[41] The incidence of premature birth, defined by weight, in a national sample was higher (6·6%) in the children of manual workers than in those of professional workers (4·3%).[8 22] In Aberdeen in 1949–51, premature births were twice as common in social classes IV and V as in classes I and II.[3] The babies of parents living in the poorer districts of Birmingham are not so heavy, on the average, as the babies of parents living in the more prosperous districts.[10] Moreover, there are marked and consistent differences between different towns and regions of England and Wales in their stillbirth-rates, and in their neonatal mortality-rates, also. These differences are of the familiar kind, with high rates in Wales and the industrial North of England.

How the social influences affect the stillbirth-rate and neonatal death-rate is not at all clear. It is noticeable, for instance, that the stillbirth-rate, which had changed little from about 40 in 1928, began to fall rapidly in 1940–41, and reached 23 in 1948—at about which figure it has since persisted (fig. 3).[38 39] Duncan, Baird, and Thomson [9] have concluded, from detailed inspection of the trends, that national food policy contributed much to the decline which took place in social classes III, IV, and V in the later years of the war, and which was particularly noticeable in deaths associated with prematurity, for example. Neonatal mortality also fell rather more rapidly after 1940 (fig. 1). However, in spite of a more homogeneous national diet,[28] social-class differences in stillbirth and neonatal rates in 1949 (fig. 4) were relatively as large as in 1939; and so were many local and regional differences in these rates. Stillbirths and infant mortality in other countries, with very varied war-time experiences, have also fallen substantially during the same period.[30] This consistency suggests that other factors besides nutrition were also concerned in the general fall, which must be studied in the context of the great decline in infectious diseases, and of other mortality trends of recent years.

The rôle of diet has been taken as an example of the difficulty in distinguishing the various factors responsible for differences between the infant-mortality rates of different groups in the population. We shall not here discuss the numerous papers concerned with these factors; but the following important influences, amongst others, have been studied: income; differences in family size; class differences in physique; quality of maternal care; work in pregnancy; the mother's education; availability of antenatal care and specialist medical services; the relative advantages of domiciliary and hospital confinement; housing conditions; and climatic differences.[2 3 20 23 25 35 42 43 47] A useful distinction can be made between, on the one hand, those factors affected by current money income, such as food and, on the other hand, those more affected by expenditure on "capital assets," such as houses and education—changes in the latter being slower to take effect.[27] It would be true to say, however, that no one or two factors mainly responsible for the social-class differences have been identified. Meanwhile, fig. 4 sets the problem in as long a perspective as possible—of wars, and peace, slump, recovery, and boom. The gap between social class I and social class V shows no signs of narrowing, in spite of much recent levelling in their circumstances, and more than forty years of health services with their differential impact—a truly remarkable piece of social history.

Fig. 3—Secular trends in stillbirth-rate in England and Wales in 1906–53.

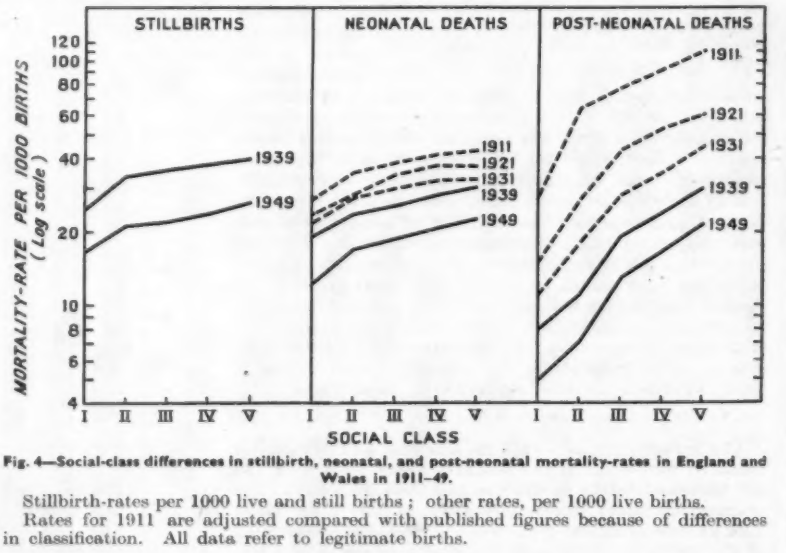


Fig. 4—Social-class differences in stillbirth, neonatal, and post-neonatal mortality-rates in England and Wales in 1911–49.

Stillbirth-rates per 1000 live and still births; other rates, per 1000 live births.
Rates for 1911 are adjusted compared with published figures because of differences in classification. All data refer to legitimate births.

Biological Factors

The effects of the biological factors in stillbirth and infant mortality are perhaps less generally known,

† Examples of the allocation of occupations to the social classes:

Social Class	*Description of occupations*	*Examples*
I	Professional, &c.	Physician, company director
II	Intermediate	Farmer, shopkeeper
III	Skilled workers	Coal-face worker, most clerks
IV	Partly skilled workers	Machine minder, most agricultural workers
V	Unskilled workers	Railway porter, builders' labourer

though information is slowly accumulating on these fundamental processes of human biology. A brief—and necessarily inadequate—summary of the main facts follows.

The proposition that *maternal age and parity* are important in the outcome of a pregnancy is well recognised in terms of the experience of the "elderly primipara," for example—her liability to toxæmia and to unexplained stillbirth and premature birth, the increased risk of difficult labour, and birth trauma. Many other relationships are recognised clinically, such as the association of *age* with fertility, with twinning, and with maternal mortality; and of *parity* with birth-weight, with the frequency of antepartum hæmorrhage and of rhesus-factor complications. The main patterns of variation of the stillbirth-rate and neonatal death-rate with maternal age and parity were first put on a sound statistical basis by Yerushalmy,[48 51] and a number of other studies have followed.[1 6 36] The stillbirth-rate increases with the *mother's age* for a given number of children (fig. 5), and the increase is sharper after the age of 30. When the variation with the *number of children* is considered, for mothers of given age, the rate is high for first births, falls sharply in second births,

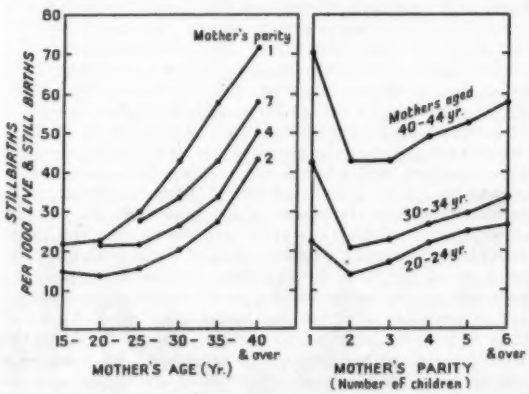


Fig. 5—Variation of stillbirth-rate, with mother's age and parity, for eight million single, legitimate live and still births in 1939–50.

and then rises steadily thereafter (fig. 5). The neonatal patterns are not so clear and will be discussed in a later paper.

In spite of these biological variations, it has been shown [41] that the differences between the stillbirth-rates of the social classes are not much affected by the fact that the professional class, for instance, contains relatively more "elderly primiparæ" who are subject to a high risk of stillbirth; or by the fact that social-class v mothers are younger on the average, which tends to reduce their rate. Whether such class differences in the age and parity of the mothers affect the neonatal and post-neonatal rates has yet to be shown, and is the subject of the third paper in the present series.

Much work still needs to be done on the relation of age and parity to the individual causes of stillbirth and infant death. Baird, Walker, and Thomson [5] have analysed 1000 stillbirths and deaths in the first week of life which occurred among booked cases in the Aberdeen Maternity Hospital during the period 1938–52, in terms of the recognised pathology, and the age and parity of the mothers. (They found, it may be mentioned, that very few of the neonatal deaths were due to conditions, such as infections, arising *after birth*.) In about one-third of all the cases no cause could be postulated, most of these being prematurely born. In about 10% death was attributable to maternal toxæmia, which was especially important in the youngest and eldest primiparæ. Antepartum hæmorrhage accounted for another 10%. Trauma during birth was responsible for 20% of the deaths, and these deaths were specially common among the older mothers, with primigravidæ worst affected. Deformity led to the deaths in 15% of the total. McKeown and his colleagues, in their detailed studies of congenital malformation, found considerable differences in the way that individual defects were related to maternal age and parity, though first birth and relatively advanced maternal age are never favourable factors.[16 19 21 32 34] That such factors are related to *deaths* from congenital malformation at all is of course interesting; if they are related to *incidence*, as McKeown's studies suggest, this is further evidence of the importance of the fœtal environment. These findings provide a link with the work of Gregg,[12] Ingalls,[14] and others on the effects of "insults" to the growing fœtus. The reports of the Registrar-General for Scotland [40] give data on the variation of the rate of stillbirth from several broad groups of causes by maternal age and parity.

The variations of the death-rates (chiefly the stillbirth-rate) with other biological factors (multiple birth, interval between births, sex of infant, &c.) have been dealt with by various authors. Some of the more important findings in the literature are:

(i) The male stillbirth and infant-death rates are higher than the female rates; the ratio of male to female stillbirths increases with the age of the mother.[18 22 36]

(ii) The ratio of males to females, for all stillbirths, for macerated fœtuses, and for anencephalus, increases with duration of gestation.[17]

(iii) Stillbirths and infant deaths due to different congenital malformations show different "sex ratios." For example, only about a quarter of stillbirths with anencephalus are males; less than a quarter of infant deaths due to congenital pyloric stenosis are in females.[28 40]

(iv) Like-sexed twins have a higher stillbirth-rate and neonatal death-rate than unlike-sexed twins.[16 52]

(v) Neonatal death-rates are much higher in multiple births than single births. Stillbirth-rates as a whole are also higher in multiple births than in single births; but the reverse appears to be true for fœtal deaths occurring before the 28th week of pregnancy.[21 46]

(vi) Multiple births occurring in the youngest mothers show a very high stillbirth-rate. This rate falls with the age of the mother to a minimum at 25–34 years and thereafter rises sharply again—in contrast to the rate for single births which shows no such early fall.[16 39]

(vii) Women who have had stillbirths are particularly likely to have further stillbirths; those who have lost a child in the first four weeks of life are particularly likely to do so again; and the same is true for post-neonatal deaths.[50]

There is an association between congenital malformation of the central nervous system in one child in a family, and abortion, stillbirth, and similar malformations in its siblings.[33]

(viii) There are indications that the spacing of births may influence the stillbirth-rate and neonatal death-rate: very close spacing, and very distant spacing, may be disadvantageous.[6 46 49 50]

(ix) There is a suggestion that consanguineous marriage may increase stillbirth and infant-mortality rates.[44]

(x) Stillbirth-rates and neonatal mortality-rates are higher for the children of younger and older fathers compared with those aged 25–34; and this holds independently of the relationship of the rates to the *mother's* age.[51]

For deaths occurring after the first few weeks of life there is no information, based on large numbers, relating to the effects of maternal age and parity, or of the other biological factors (except the infant's sex). The available evidence [4 6 11 35] suggests that the influences of age and parity in the post-neonatal period differ from their effects on the stillbirth and neonatal mortality rates.

* * *

The Present Inquiry

The present inquiry, which is an epidemiological exercise in the vital statistics of infant mortality, uses

the documents of birth and death registration of England and Wales, and for the first time brings them together. Information about the mother's age, the number of her children, the duration of her marriage before the birth, and whether the birth was single or multiple, is obtained at birth registration (but not for the public record); while other data, such as the age of the infant, and the cause of death, are obtained when the death is registered. Information on the social circumstances surrounding the birth or death, such as the father's occupation, the community in which the family lived, and the infant's legitimacy is also available. All this material will be brought together for the two years 1949–50, and for the whole of England and Wales. Since similar information for stillbirths was easily available at the same time they are also included in the inquiry. In addition, mortality in the second year of life of children born in 1949 is being studied.

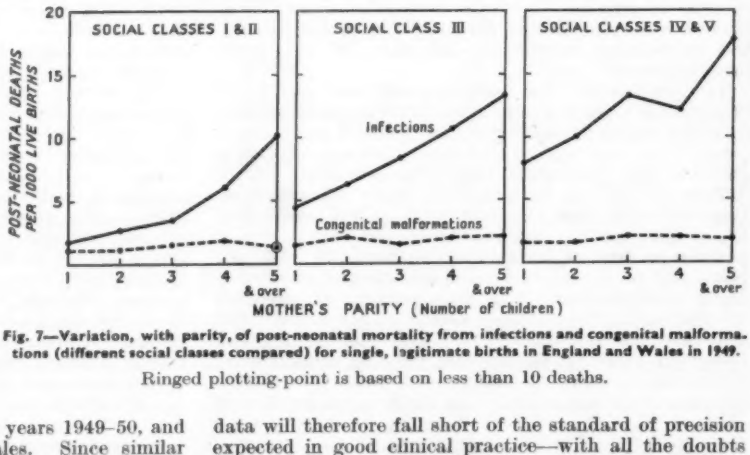


Fig. 7—Variation, with parity, of post-neonatal mortality from infections and congenital malformations (different social classes compared) for single, legitimate births in England and Wales in 1949.

Ringed plotting-point is based on less than 10 deaths.

There are several problems on which it is hoped that the inquiry will provide useful information.

The influence on the death-rates of the *mother's age*, and *the number of children* she has borne, will be examined in a variety of social circumstances. It will be possible to say, with some certainty, for instance, whether the increase in the stillbirth-rate associated with a first birth is greater for the wives of unskilled workers than for those of professional men; whether the infant-mortality rates for social class V are high because of their larger families; and whether the rates in the North of England are higher merely because there are more people in social classes IV and V there than in the south.‡ This analysis will be made for the deaths occurring at various ages during the first two years of life, and particular attention will be paid to the "perinatal" period of greatest risk.

The next step will be to investigate whether maternal age and parity have different influences in relation to the different certified *causes of death*. Deaths from and with "prematurity" are a leading example. Unfortunately there are serious difficulties in interpreting the causes of infant death as given on death certificates,[24] and the data will therefore fall short of the standard of precision expected in good clinical practice—with all the doubts that may remain in this. However, what is lost in pathological precision may, it is hoped, be made good in other ways. An example of some of the questions which the present analysis will raise is shown in figs. 6 and 7. The more children there are in the family the higher the post-neonatal death-rate from infection; whereas there seems to be no such association of family size with deaths from congenital malformation (taken all together) at this age; and these observations apply in each of three social-class groups Moreover it is the conjunction of young mother and large family that seems particularly to matter. The demonstration of such relationships is peculiarly within the scope of an epidemiological study such as this—which thus adds something that the usual clinical study cannot provide. Again, some control of the precision of the data about causes will be attempted by reference to the presence of a post-mortem examination, and by separate study of deaths taking place in hospital. Thus it will be possible to analyse almost 2000 deaths from congenital malformation, confirmed by necropsy, and to relate the anatomical sites of disturbance, even if only in broad terms, to the age of the mother, the number of children she has borne, any loss of previous children, and so on. No information is available in this inquiry about the *causes* of stillbirth, either in terms of maternal disease or of fœtal pathology. But the whole history of vital statistics confirms that analysis of crude categories, such as "stillbirth," can be well worth while.

‡ As at present progressing the inquiry is less concerned with "climatic" factors; though it is hoped to remedy this later.

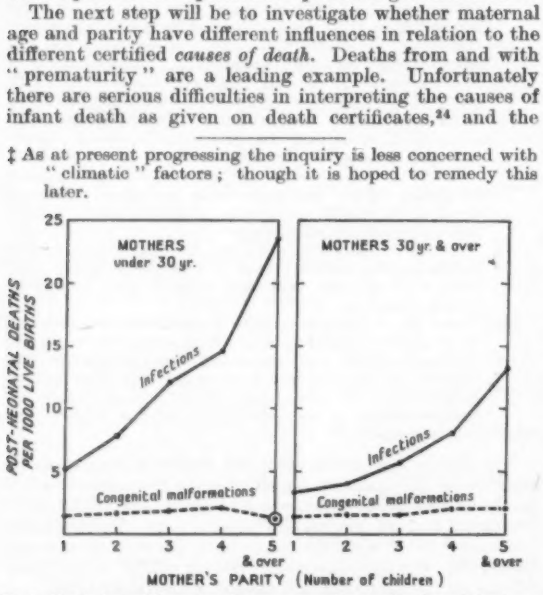


Fig. 6—Variation, with parity, of post-neonatal mortality from infections and congenital malformations (younger and older mothers compared) for single, legitimate births in England and Wales in 1949.

Ringed plotting-point is based on less than 10 deaths.

As mentioned earlier, *birth spacing* may be a factor affecting the death-rates. The inquiry, by analysing infant mortality in terms of duration of marriage and the mother's parity, can contrast the infant-mortality rate for women who have had a large number of children in a short married life (and therefore in rapid succession), with the rate for women who have had few children in a long married life; the two groups of women being matched for the contingent variables of age and social class. This is an indirect, and rather a blunt approach, but it is difficult to get any information at all on the subject. It will also be possible to study the infant-mortality rates for women having their first baby before, soon after, and a long time after their marriage—with possible implications about the relationship of the mother's fertility to subsequent infant loss.

An association has been mentioned between the occurrence of stillbirths and infant deaths and the *loss of previous children by the same mother*. This "proneness" to lose children will be examined in various groups of mothers, and evidence sought whether some causes of death (e.g., congenital malformation, or "prematurity" not further defined) are more responsible than others.

Unfortunately it will not be possible to trace the causes of, or even ages at, death of the previous children; and no information is available about the mother's medical history apart from the fact that she has previously lost a stated number of children.

Some problems will be investigated because the present large-scale approach provides the opportunity, and there is a duty in the circumstances to explore. The contrast between the effects of the mother's age on *single and multiple* stillbirths has been mentioned. The present inquiry will examine the neonatal and post-neonatal death-rates among children of single and multiple births for similar contrasts. (Fig. 8 shows, for instance, that the risk of death in the first four weeks of life is of the order of one in six for multiple births to women under 20, there being no correspondingly high risk for single births to these very young mothers.) Again, it has been stated that stillbirth-rates and neonatal death-rates are higher among *like-sexed than unlike-sexed twins*. Is this true of the death-rates in the next eleven months of life? (Direct genetic inquiry is beyond the scope of the present study.) Further, the *excess of male over female* stillbirths increases with mother's age. Is this true also of infant mortality?

Since the present inquiry deals only with the documents of vital statistics, study of the *social factors* which it will be possible to make is strictly limited. No direct information will be available, for example, on patterns of child care and other aspects of family behaviour, on psychological influences, or even on such elementary matters as family income and expenditure. Very little can be obtained on the hundreds of thousands of life-histories preceding the events being examined. The social analysis will be mainly in terms of the grading of the population (mentioned before) into five "social classes," as used by the General Register Office in the 1951 census tables. This does not provide a classification of individuals on the basis of their personal circumstances other than occupation, and it is thus in some respects crude and ill-defined. Nevertheless, since its introduction forty years ago, it has proved the most effective instrument for social-medical research in this (or any other) country. The allocation of mothers and infants to social class is by father's occupation, and certain occupation groups are being studied as well as the five classes. The number of these, however, is limited by practical considerations; and those selected will, it is hoped, broadly exemplify ways of life, as well as make it possible to deal with specific problems. Miners, for instance, have been chosen for special study because their infant-mortality experience in the 1930s was particularly unfortunate. Was this due only to their special poverty[26] in the inter-war years? One of the lesser objects of the present inquiry is to yield some "hindsight" on such questions, by analysis of the contemporary (and, in this instance, very different economic) situation. In the present inquiry the facts about the father's occupation are taken from the birth record, both for the dead children (since the records of birth and death are now linked) and for the live births which form the basis ("denominator") of the infant-mortality rates. Hence it is possible, in line with the aims of the inquiry, to concentrate on the circumstances of the birth; in addition, there is no error comparable to that which occurs in adult occupational-mortality rates when the information about the death appears on a different document, and refers to a different time, from the census information about the "population at risk."

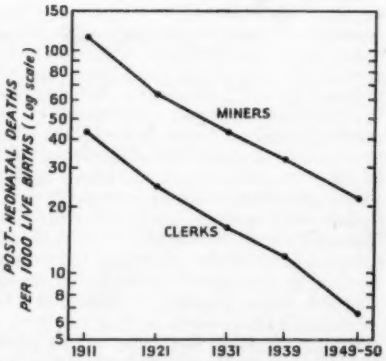


Fig. 9—Secular trends in post-neonatal mortality of children of miners and of clerks in England and Wales in 1911–50. (Legitimate births.)

The inquiry as a whole was designed of intention—and necessity—to be close to the 1951 census, and it is proposed to make as much use as possible of the social data that will become available from the census. Information on school-leaving ages in various occupation groups will be used as an indicator of educational level, and more remotely of culture patterns in different groups; similar information will also be available for various geographical areas. In addition, considerable use will be made of the census information on housing conditions and amenities in different towns and different parts of the country. The classical studies by Farr, Simon, Newsholme, and others of infant mortality in relation to the physical environment and the "micro-climate," will thus be brought up to date in a small way vis-à-vis the changing family composition, changing standards of living, post-war housing problems, and increasing urbanisation and suburbanisation—and the low infant-mortality rates achieved in recent years. The unexpected uniformity in the fall of the stillbirth and infant-mortality rates in the five social classes (fig. 4) will be further explored in terms of the experience of particular occupations, such as miners and clerks (fig. 9), and of different parts of the country. Plans have not yet been made to study the varying social services of different communities in relation to mortality. As a start, however, the death-rates will be analysed according to the place of confinement—at home, in hospital, or in a nursing-home—having in mind the different admission policies in different

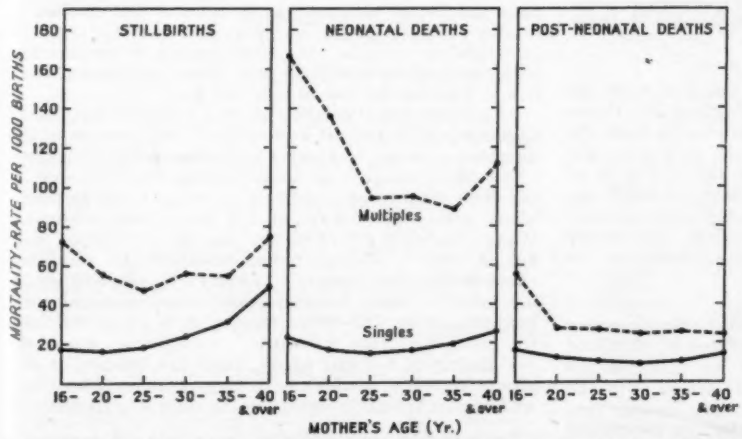


Fig. 8—Variation, with mother's age, of the stillbirth and infant-mortality rates (single and multiple births compared) for legitimate births in England and Wales in 1949.

Stillbirth-rates, per 1000 live and still births; other rates, per 1000 live births.

areas. "*Legitimacy*," "*illegitimacy*," and "*prenuptial conception*" are of course social concepts, and they have many associations with poverty, with type of community and educational levels, as well as with family upbringing and individual social experiences. Moreover, the mothers concerned are younger, on the average, than married women; and more of them are having their first babies. A study of the known unfortunate experience of illegitimate babies is therefore inadequate if it does not refer to these various factors.[42]

Reference is made earlier to a division of factors into "*social*" and "*biological*." This classification was adopted mainly for historical reasons, for convenience, and (it is hoped) for clarity. It seems useful to distinguish, where possible, "biological" factors, by which is meant factors such as the mother's age which have meaning whatever the social setting (they can be applied to other creatures, and, indeed, the influence of maternal age is well recognised by animal breeders), and factors, such as occupation, which derive their meaning from "social" organisation. Certain factors, however, could be classed as "biological" from some points of view, and "social" from others: duration of marriage, and spacing of children are both examples of this. In the last resort social factors must act through the biological, though not necessarily the ones included in this inquiry; while the importance of the biological factors for preventive medicine lies in the degree to which they can, if indeed they should, be controlled by individual and community action. It must be remembered that, so far as developing embryo and fœtus are concerned, all factors, however they have been described, are truly "environmental"—whence such hopeful notions as "antenatal pædiatrics."

Opportunity and Method

The opportunity to carry out the present inquiry was provided by the Population (Statistics) Act, 1938. This Act, the main purpose of which was to collect material relating to fertility, was passed at a time of considerable public concern with the population trend. It provided for the recording, under conditions of secrecy and for statistical purposes only, of the age of the mother, the number of previous children born to her, and the date of her present marriage, for every confinement in England and Wales from July, 1938, onwards. Since then, therefore, the basic data for a study of the relationship between these biological and the more commonly studied social factors in infant mortality, and using national statistics, has been in existence. Early in 1948, after a preliminary reconnaissance, the Social Medicine Research Unit suggested such an investigation to the General Register Office who agreed on a joint inquiry.

Numbers

The inquiry is concerned in round numbers with the $1^1/_2$ million births which occurred in England and Wales in 1949 and 1950 (the "population at risk"), with the 33,000 of them which were stillbirths, and with the 44,000 or so where the baby died in the first year of life. The opportunity will also be taken to study the deaths in their second year of life of the children born in 1949: there were about 1600 such deaths. This makes a total of about 80,000 deaths and stillbirths to be analysed.

Basic Document

The basic document used in this entirely documentary study is a special form which is completed by the local registrar from information supplied to him by the "informant" of a birth or death. The actual birth and death certificates themselves are not used, because they do not contain the data obtained under the Population (Statistics) Act. The place of residence of the parents, and other data such as the name of the child, its sex, and the place of birth, appear on the birth certificate; but details of the mother's age, her previous children and the date of her marriage, do not. For deaths, the cause of death is given on his certificate by the medical practitioner, and is copied on to the form by the registrar, who also enters on it other information, such as the father's occupation, obtained directly from the informant.

Relating Births to Deaths

The essential practical problem was to find which of the babies born in 1949 and 1950 died in infancy. After various relatively unsuccessful pilot trials in 1948 which used different methods of tracing, a method was evolved which proved very successful in practice and which depended on the war-time National Registration system. The birth records corresponding to 99·4% of the registered deaths of the infants concerned were traced.§

Having traced the relevant birth entry it merely remained for the General Register Office to record the information about both the birth and the death on the same form, and to punch machine cards from it for sorting and tabulation.

Comment on Method

An essential element in this inquiry is that it is "longitudinal" and "prospective" (? "proleptic"). That is to say, it takes a set of persons (babies) and, observing the conditions which affect them at a certain time (birth), follows them all for a stated period. An attempt is made to assess the differing experience (in the present instance the numbers of deaths, and their causes) of children born in different circumstances, social and biological. This "cohort" approach can have wide application in vital statistics. For example, it might help to fill the often puzzling gap in our knowledge when a good deal is known of the circumstances in which a condition occurs, but little of why it selects some and not others for its victims: What is the previous medical and gynæcological record of women who have premature babies, compared with those who do not? Or the medical and occupational history of men who subsequently develop coronary heart-disease?[13] Attempts to obtain this kind of information *retrospectively* often meet with disappointment. A clear instance of the value of the "prospective" approach is to be found in the recent studies of smoking and cancer of the lung.[7] The approach, however, may be particularly expensive to apply, because in the nature of things a long period of observation may be necessary, and because a large cohort, few of whom will develop the disease, may need to be under continuous and uniform observation. The opportunities for carrying out such work occur ideally, therefore, when the necessary data are being obtained as a routine for another—it may be administrative—purpose. In the present investigation various statutory records in connection with the processes of birth and death registration were linked together for use in this way.

A further point is that in this type of large-scale epidemiological study it is possible, if only because of the numbers involved, to observe patterns and configurations of several "causes" or factors acting together, and at the same time more effectively to break down the combined action into some of the constituent elements. What this means in practice can be illustrated from figs. 6 and 7. These figures describe the combined effect of the three factors of social class, age, and parity in relation to deaths from infectious disease and congenital malformations. All three factors, it is clear, influence the mortality from infections. Considering, then, the two factors of age and parity, there are indications of a group of young mothers with large families who might well be paid special attention by the child-welfare services.

§ Emigration could have affected the validity of the rates, but a sample investigation showed that it did not. Details of the method of tracing, of the 0·6% untraced, and of the emigration sample, will be given in the final report.

The trend of mortality with social class (alone) gives promise of a reduction in mortality-rates from social improvements, whatever the age and size of family.

* * *

Conclusion

Infant mortality and stillbirths remain an important problem despite the great achievements of recent years. The number of stillbirths in 1953 was almost 16,000; of deaths in the first week of life some 10,000; in the remainder of the first four weeks about 2000; and the post-neonatal period 6000. The total of 34,000 was about 6% of all deaths, but because these deaths occurred at the outset of life they represented considerably more than 6% of the total wastage of life (in the sense of reasonable expectation of years to be lived) caused by all untimely deaths.

The present inquiry will describe the contemporary range of mortality-rates, and the lowest of these will indicate a goal which can be achieved in the present state of medical knowledge. "Vulnerable" groups with particularly unfavourable rates will be defined in various biological and social terms, and the inquiry may thus indicate where, and perhaps what, preventive measures could be taken. Moreover, though the present approach is through infant mortality, it is a principle of preventive medicine that mortality represents only the tip of the iceberg of morbidity; and the negative approach through morbidity and mortality still remains as fruitful an approach as any to the practical definition of healthy conditions. The main contribution which epidemiology can make in our present ignorance of the immediate, intimate causes of stillbirth and neonatal mortality is to distinguish sections of the population with high mortality-rates, and low, so that underlying causes of mortality can be postulated. These causes are likely to be general and non-specific; and they may well offer opportunities for preventive action.

We are grateful for the help of many people in this inquiry: to members of the staff of the General Register Office at Somerset House and in Southport, for a very large share of the work and for their indispensable advice throughout; to the Registrars-General of Scotland, Northern Ireland, the Isle of Man, and Guernsey, and the Superintendent Registrar of Jersey, for help with the emigration problem; to Prof. Dugald Baird, Prof. R. M. Titmuss (who was an original member of the team), Dr. Barnet Woolf, and Dr. A. M. Thomson for criticism and advice; and to our scientific, clerical, and computing colleagues, and particularly to Mr. J. Longden, first statistician to the Social Medicine Research Unit, who was in charge of the detailed work at the beginning of the inquiry.

REFERENCES

1. Baird, D. (1945) *J. Obstet. Gynæc., Brit. Emp.* **52**, 217.
2. — (1947) *Lancet*, ii, 531.
3. — Illsley, R. (1953) *Proc. R. Soc. Med.* **46**, 53.
4. — Thomson, A. M., Duncan, E. H. L. (1953) *J. Obstet. Gynæc., Brit. Emp.* **60**, 17.
5. — Walker, J., Thomson, A. M. (1954) *Ibid*, **61**, 433.
6. Burns, C. M. (1942) Infant and Maternal Mortality in Relation to Size of Family and Rapidity of Breeding. King's College, University of Durham.
7. Doll, R., Hill, A. B. (1954) *Brit. med. J.* i, 1451.
8. Douglas, J. W. B. (1950) *J. Obstet. Gynæc., Brit. Emp.* **57**, 143.
9. Duncan, E. H. L., Baird, D., Thomson, A. M. (1952) *Ibid*, **59**, 183.
10. Gibson, J. R., McKeown, T. (1951) *Brit. J. soc. Med.* **5**, 259.
11. — — (1952) *Ibid*, **6**, 183.
12. Gregg, N. McA. (1941) *Trans. ophthal. Soc. Aust.* **3**, 35.
13. Heady, J. A., Morris, J. N., Lloyd, F. J., Raffle, P. A. B. (1954) *Brit. J. industr. Med.* **11**, 20.
14. Ingalls, T. H. (1953) *In* Advances in Pediatrics. Chicago.
15. Lowe, C. R., McKeown, T. (1950) *Brit. J. soc. Med.* **4**, 75.
16. — Record, R. G. (1951) *Ibid*, **5**, 34.
17. McKeown, T., Lowe, C. R. (1951) *Hum. Biol.* **23**, 41.
18. — McMahon, B., Record, R. G. (1951) *Ann. Eugen., Lond.* **16**, 249.
19. — — — (1953) *Amer. J. hum. Genet.* **5**, 168.
20. McKinlay, P. L. (1950) *Hlth Bull., Edinb.* **8**, 16.
21. McMahon, B., McKeown, T. (1953) *Amer. J. hum. Genet.* **5**, 176.
22. Martin, W. J. (1951) *J. R. statist. Soc.* **114**, 287.
23. Maternity in Great Britain (1948) London.
24. Miller, F. J. W. (1942) *Lancet*, ii, 269.
25. Ministry of Health (1953 and previous years) Reports on the State of the Public Health.
26. Morris, J. N. (1947) *Lancet*, ii, 341.
27. — (1953) A paper given before the British Sociological Association's Conference on Social Policy and the Social Sciences.

References continued at foot of next column

Medicine and the Law

Negligence Appeal Fails

THE Court of Appeal have upheld the finding of Mr. Justice Gorman [1] that the late Mr. C. A. Joll was fit to perform an operation although suffering from cancer at the time.[2] The action had been brought by Mrs. Winifred M. Nickolls against the Ministry of Health, as successors under the National Health Service Act to the liabilities of the Royal Free Hospital, for negligent performance of an operation for the removal of a goitre, performed on her in December, 1944.

The plaintiff alleged that Mr. Joll was then suffering from carcinoma of the lung, and that he and the defendants knew or should have known that he was unfit to perform the operation. As a result of it, the plaintiff was now suffering from permanent bilateral recurrent laryngeal paralysis.

Lord Justice Denning's judgment is of importance to the whole profession. His Lordship said that he could not help feeling that owing to Mr. Joll's state of health something or other went wrong in the operation. But that could not be said to be negligence unless one was to say that every time a surgeon was taken ill in an operating-theatre that would be negligence. It was not want of skill, or that Mr. Joll was not paying attention, or anything of that kind. The real point was whether Mr. Joll should have undertaken the operation at all. It was a very arduous and important task to operate on other people, and surgeons ought not to do it unless they were fit to do it. But Mr. Justice Gorman came to a very firm conclusion that Mr. Joll was quite fit to perform this particular operation, even though he was suffering from cancer, and the Court could not overrule the judge on that point. The other lords justices concurred.

Negligence actions must always turn largely on the facts in each particular case. Hence, the judgments in the present case do not lay down hard-and-fast rules, but they do indicate general principles. It now seems that it is not necessarily negligence to operate when unwell, but that a surgeon should ask himself "Am I fit to perform this particular operation?"

1. See *Lancet*, 1954, ii, 88.
2. *Times*, Feb. 4, 1955.

DR. MORRIS, MR. HEADY: REFERENCES—*continued*

28. National Food Survey Committee (1952) Domestic Food Consumption and Expenditure, 1950.
29. Peller, S. (1948) *Popul. Stud.* **1**, 405.
30. Posthuma, J. H. (1953) *Tijdschr. Soc. Geneesk.* May 29, p. 273.
31. Record, R. G., Gibson, J. R., McKeown, T. (1952) *J. Obstet. Gynæc., Brit. Emp.* **59**, 471.
32. — McKeown, T. (1949) *Brit. J. soc. Med.* **3**, 183.
33. — — (1950) *Ibid*, **4**, 26.
34. — — (1953) *Brit. Heart J.* **15**, 376.
35. Registrar General (1923) Census of England and Wales, 1911, vol. XIII. Fertility of Marriage, part II.
36. — (1951) Statistical Review of England and Wales, 1940–45, Text, vol. II. Civil.
37. — (1954) Decennial Supplement, England and Wales, 1951, Occupational Mortality, part I.
38. — (various years) Statistical Review of England and Wales, Tables, part I. Medical.
39. — (various years) Statistical Review of England and Wales, Tables, part II. Civil.
40. Registrar-General for Scotland (various years) Annual report.
41. Royal Commission on Population (1950) vol. IV. Reports of the Biological and Medical Committee.
42. Spence, J., Walton, W. S., Miller, F. J. W., Court, S. D. M. (1954). A Thousand Families in Newcastle-upon-Tyne. London.
43. Sutherland, I. (1949) Stillbirths, their Epidemiology and Social Significance. London.
44. Sutter, J., Tabah, L. (1954) *Eugen. Quart.* **1**, 148.
45. United States Department of Health, Education and Welfare (1954) Vital Statistics—Special Reports, National Summaries, **38**, 310.
46. Woodbury, R. M. (1926) Infant Mortality and its Causes. Baltimore.
47. Woolf, B. (1947) *Brit. J. soc. Med.* **1**, 73.
48. Yerushalmy, J. (1938) *Amer. J. Hyg.* **28**, 244.
49. — (1945) *Hum. Biol.* **17**, 65.
50. — Bierman, J. M., Kemp, D. H., Connor, A., French, F. E. (1954) A paper given before the American Public Health Association (in the press).
51. — Palmer, C. E., Kramer, M. (1940) *Publ. Hlth Rep., Wash.* **55**, 1195.
52. — Sheerar, S. E. (1940) *Hum. Biol.* **12**, 247.

Parliament

Clean Air Bill

IN the House of Commons on Feb. 4, Mr. GERALD NABARRO moved the second reading of his Clean Air Bill as a private member's measure. After a long debate, Mr. DUNCAN SANDYS, Minister of Housing and Local Government, said that the Government were in agreement with the policy advocated by the Beaver Committee's report and warmly supported the objectives of Mr. Nabarro's Bill. But it had of necessity been framed without full consultation with industry and with local authorities, and it did not, and could not, contain the financial provisions necessary to make it fully effective. In the circumstances he felt that it would be better to have a Government Bill; and on the completion of the consultations now proceeding with local authorities and industry, the Government would introduce a comprehensive measure which would follow the general lines of the recommendations of the Beaver Committee. This would not preclude the Government from considering additional or alternative proposals. He could make no promise about the date of the introduction of the Bill except that there would be no avoidable delay and it would, of course, be introduced during the present session. Whether the Bill would get through all its stages this session would largely depend on how far it proved to be an agreed measure. Hon. Members would have to choose between a small bird in the hand and a bigger bird in the bush and he had no doubt that they would choose wisely. Mr. Nabarro accordingly withdrew his Bill.

Social Services in the Colonies

In the House of Commons, on Feb. 2, Mr. A. T. LENNOX-BOYD, Secretary of State for the Colonies, moved the second reading of the Colonial Development and Welfare Bill. He said that the Acts of 1945 and 1950 voted £140 million for colonial development and welfare from 1946 to 1956. The new Bill extended the life of these Acts until March 31, 1960, and provided another £80 million of new money, which, together with the unexpended sum of £40 million, provided a really worthwhile contribution to colonial development and welfare.

Mr. JAMES GRIFFITHS welcomed the Bill, but regarded the provision which it made as woefully inadequate. It meant that the people in this country were contributing to the Colonial Development Fund 10*s.* per head per annum for the next five years. Distributed among the 80 million people of the Colonies that came to about 6*s.* per head. We had helped the Colonial Territories to develop their social services and to build hospitals, and now they were confronted with recurrent expenditure. If the Colonies were to sustain their level of social services, the pace of development must be accelerated instead of being merely maintained. But the major problem in all the Colonies was that populations were increasing more rapidly than food production. Priority no. 1, therefore, must be to produce more food.

Mr. THOMAS REID, held that unless birth-control was established in the Colonies all our efforts would be doomed to failure. But he admitted that he did not know how this could be done, because it was opposed to the habits, customs, and often the religions of the people. Mr. M. PHILIPS PRICE did not believe that birth-control was likely to have much effect among primitive tribes. Family limitation might be encouraged by the growth of education among the peasantry, but the danger was that there was bound to be a time-lag between the effect of education in reducing the birth-rate and the speed of increase in the food resources. A country might well founder in the next hundred years or so if some means could not be found to reduce that time-lag. The problem of raising the standard of cultivation of the land was really that of getting adequate staffs of agricultural advisers and veterinary practitioners.

Replying to the debate, Mr. HENRY HOPKINSON, Minister of State for Colonial Affairs, said that the Government could not agree that the provision made by this Bill was woefully inadequate. Over a five-year period the Bill would make available £120 million, including the £40 million carry-over. The estimates had been considered in the light of the physical ability of the colonial governments to carry out the work. They had also had to consider to what extent those governments would be able to pay for the upkeep of the extensive capital works, including hospitals which required more doctors and nurses and so on. A too rapid advance could easily lead to bankruptcy. But this did not mean that the United Kingdom Government did not intend to go on helping the colonial governments with their social services, and other matters which involved recurrent expenses. But, as far as they could judge, even taking into consideration the fall in the value of money, £120 million, together with what the colonial governments could obtain from their own resources, should be enough to enable them to maintain the pace which they had achieved.

QUESTION TIME

Scottish Drug Tariff

Replying to a question Commander T. D. GALBRAITH, joint parliamentary under-secretary of State for Scotland, said that the question whether the present drug tariff for Scotland was in accordance with the award of the arbitration tribunal of June, 1951, was recently referred, by agreement between the Scottish chemists and the Secretary of State for Scotland, to the members of the tribunal. They stated that the present tariff was not contrary to their 1951 award.

Illicit Drug Traffic

Captain H. B. KERBY asked the Home Secretary to what extent illicit drug traffic had increased in Britain since the war; and what evidence he had of the effect of the current immigration of West Indians into Britain upon the illicit traffic in drugs, especially marihuana, in this country.—Major GWILYM LLOYD-GEORGE replied: In the United Kingdom, both before and since the war, the illicit traffic in dangerous drugs has been small. There is virtually no traffic in manufactured drugs and, since the war, traffic in opium appears to have declined. There has, however, been some increase in the traffic in Indian hemp (sometimes called marihuana), and a particularly close watch is being kept on this problem. Those convicted of offences in respect of this drug in recent years include a small number of West Indians, but none of these was a very recent immigrant.

Prison Welfare Officers

Replying to a question, Major LLOYD-GEORGE said that he had authorised the prison commissioners, in consultation with the National Association of Discharged Prisoners' Aid Societies, to initiate during the coming financial year an experimental pilot scheme which would provide for the appointment of prison welfare officers at three or four selected local prisons at which the local aid society would welcome such an appointment.

University Grants

Replying to a question, Mr. HENRY BROOKE, Financial Secretary to the Treasury, said that the Chancellor of the Exchequer looked to the University Grants Committee, which was appointed by him and in which he had full confidence, to supervise the use made by the universities of the grants made to them by the Treasury on the committee's recommendation. These grants were borne on the universities and colleges vote for which the Treasury accounted. The committee published a five-yearly review of university development, and an annual summary of the statistical and financial returns made to it by universities and colleges. The committee also reported fully to the Chancellor on the occasion of his quinquennial review of university finance, as well as in any special problems on which he might require its advice from time to time.

Child Allowances

Replying to a question asking what would be the estimated cost to the Exchequer if, in place of the fixed £85 per child, an earned-income child-allowance were introduced based on one-tenth of the parent's income, rising to a maximum

allowance per child which would not exceed £150 per annum, Mr. BROOKE said that it was intended that the present allowance of £85 should be retained as a minimum applicable to incomes below £850; the cost of increasing the child-allowance for incomes above the level to 10% of income, with a maximum of £150, would be about £21 million in a full year. If, on the other hand, the allowance were restricted to 10% at all income-levels, so that those with incomes below £850 received a smaller allowance than at present, there would actually be a net gain to the Exchequer of about £5 million.

State Scholarships

Replying to a question, Sir DAVID ECCLES, Minister of Education, said that the annual cost of State scholarships was about £2½ million. If parents contributed nothing this would be increased by about £800,000.

Fluoridation of Water-supply

Mr. S. P. VIANT asked the Minister of Health whether Anglesey water authority had yet investigated for fluorine-content the urine of the area in which fluoridation was to be introduced and the urine of the control area; how many persons participated in this investigation and what were their ages; how far the condition of teeth of infants and older children in the areas had been ascertained; what were the ages of those whose teeth were examined; how many had their teeth examined for this investigation; and if he would ensure that accurate and consecutive records of fluorine content of urine and condition of teeth were kept in the two areas.—Mr. IAIN MACLEOD replied: A pilot study of urinary excretion of fluoride in children in this country confirms the result of work done in the United States and New Zealand and makes it clear that more exclusive studies need not be undertaken before fluoridation in Anglesey is begun. Arrangements are now being made to examine the teeth of samples of children in each age-group up to and including 15 years (and to some extent of adults) and consecutive records will, of course, be kept of all the most relevant facts.

Hospital Pay-beds

Mr. SOMERVILLE HASTINGS asked the Minister how many section-5 pay-beds there were in the teaching and general hospitals, respectively, under his control; and what was the daily average occupation in each of these by paying and non-paying patients during 1954 or the latest convenient 12 months.—Mr. MACLEOD replied: Figures for 1954 are not yet available. At December 31, 1953, the number of beds in England and Wales designated under section 5 of the National Health Service Act, 1946, was 1550 in teaching hospitals and 3697 in other non-mental hospitals. The average daily occupancy during 1953 was:

	Teaching hospitals	*Other non-mental hospitals*
Paying patients	967·5	1630
Non-paying patients	217	720

Clinical Experiments

Mr. S. T. SWINGLER asked the Minister of Health if he would restrict clinical experiments in hospitals under the National Health Service to patients who had volunteered.—Mr. MACLEOD replied: I agree that the consent of the patient or of the parents of children should be obtained before clinical research is undertaken, and I have no reason to suppose that this is not the usual practice.

Replying to a further question, Mr. Macleod said that clinical investigations of infants under the authority of the clinician in charge of the case, and with the consent of the parents or guardians, were essential to an improved knowledge of infantile diseases, and he would not be justified in prohibiting such experiments.

Visits of Midwives

Replying to a question, Miss PATRICIA HORNSBY-SMITH, parliamentary secretary to the Ministry of Health, said that there were no departmental regulations on the attendance of the midwife after a confinement, which was governed by the National Health Service Act, 1946, section 23, the Midwives Act, 1951, and the rules of the Central Midwives Board. None of these specified the number of visits per day to be paid, but under the rules of the Central Midwives Board a record was required to be kept by the midwife which provided for a daily report for the first nine days after the birth and then after the eleventh and fourteenth days. Moreover, the code of practice advised midwives to pay morning and evening visits for the first few days after delivery.

Public Health

Typhoid in Yorkshire

IN the outbreak of typhoid fever in the Pickering area of Yorkshire there have been about 30 suspected cases, of which 5 have been confirmed.[1] The organism responsible is type E1. Examination of water-supplies has proved negative, and suspicions have centred on certain food which, it is understood, was available to the public on one day only. The outbreak seems to have begun during the influenza epidemic at the end of December, and there is some evidence that the use of antibiotics in the treatment of what was thought to be continued fever due to a complication of influenza may have obscured the picture of early typhoid and made clinical diagnosis even more difficult.

Smallpox in France

A message from Paris gives the total number of cases of smallpox so far reported in the Morbihan department as 66, of which 14 have died. In addition, 1 case is reported from Rennes in the Ille-et-Vilaine department, which adjoins Morbihan; and there have been 2 cases in the town of Saint-Die in the Vosges department. Agricultural workers from Brittany go to Jersey for the early potato and tomato season, and as a precaution vaccination is being offered free to all on the island.[2] Workers arriving from France are now being asked to produce a clearance certificate.

Local Population Estimates for 1954

The Registrar-General has issued final estimates[3] of the populations of counties, boroughs, and urban and rural districts in England and Wales on June 30, 1954. Grouped figures are given for the standard regions and conurbations, and density aggregates by sex and age for the country as a whole. In the London area the centrifugal dispersion of the population is reflected in the increased populations of the boroughs of Romford, Reigate, and Hemel Hempstead, and of the rural and urban districts of Elstree, Billericay, Stevenage, Welwyn Garden City, and Horsham. The populations of the administrative counties of London and Middlesex once again show a small decrease.

1. *Yorkshire Post*, Feb. 4, 1955.
2. *Times*, Feb. 4, 1955.
3. The Registrar-General's Estimates of the Population of England and Wales: Population of each Administrative Area at June 30, 1954. H.M. Stationery Office. 9*d*.

Infectious Diseases in England and Wales

Disease	Week ended January				
	1	8	15	22	29*
Diphtheria	13	13	14	8	23
Dysentery	340	346	402	482	678
Encephalitis:					
Infective	4	1	2	2	2
Postinfectious	...	...	3	2	1
Food-poisoning	131	124	114	119	90
Measles, excluding rubella	8320	9388	7800	7083	10,697
Meningococcal infection	31	42	40	32	38
Ophthalmia neonatorum	11	28	23	28	30
Paratyphoid fever	11	4	2	2	4
Pneumonia, primary or influenzal	1108	1135	1121	929	1062
Poliomyelitis:					
Paralytic	29	22	15	16	16
Non-paralytic	2	3	7	8	7
Puerperal pyrexia	196	245	244	240	267
Scarlet fever	708	464	465	650	745
Smallpox	...	...	...	...	...
Tuberculosis:					
Respiratory	526	642	627	625	629
Meninges and C.N.S.	6	17	14	9	16
Other	78	90	84	66	84
Typhoid fever	4	4	3	1	9
Whooping-cough	1723	1793	1769	2002	2237

*Not including late returns.

In England Now

A Running Commentary by Peripatetic Correspondents

BETWEEN Wakefield and Leeds, if you go by the train, you will see in the drab fields, a few dismal and seemingly dilapidated, long, low wooden shacks, tar-painted black, redeemed by a well-pointed brick fire-place and chimney, usually at the end of the inner of three, four, or five sheds. A larger, higher shed towards the road-end is all that is to be seen in the otherwise poor field. On our walks we never saw anyone working there, not even to stoke the fire which always burned very slowly. But yesterday an old man came towards us from one of the low sheds and offered to show us his wonderful rhubarb.

The fading light from the low doorway showed a wide, low-pitched roof with very low eaves, in which a few point sources of light revealed broad beds in which young rhubarb grew. Our host and guide closed the door and lit some candles stuck upon sticks around the first three beds. From a velvet-blackness young shoots of pastel pink, almost translucent, rose with elegance, grace, and sometimes inclining dignity, with such dainty heads so softly poised and curled and yellow—a galaxy of court ladies waiting to curtsy to the queen.

As our host lit more and more candles, we saw a series of broad earth-beds, of 12–18 inches depth and 8–10 feet in length, that ran from side to side of the shed leaving small footpaths near the eaves and between the beds. The air was warm and humid. The warmth was provided by a brick duct that ran the length of the shed and came from the flue of the outside fire. The rhubarb-farmer explained that the absence of all light (etiolation) was necessary to preserve the delicate colours of stalk and leaf; electric light was inclined to be left on and forgotten (candles burn out), and even the light from a central 100-watt bulb over each bed was enough to deepen the leaf. Candle-light was used only when people were working in the sheds—when the beds were given a fine spraying with water in the early sprouting stages and later to provide a regular supply; or in the mornings, between 3.30 and 4 A.M., when picking began. The picking called for team-work. The pickers worked the beds, filling baskets. These were taken out to the large shed, which alone had bright electric light, where the rhubarb was carefully packed into boxes, by weight, and these as quickly loaded on a waiting lorry. Special fruit wagons of fast freight trains left regularly from the Midlands during January, he told us, for Newcastle and the North and London and the South. He mourned the variability of the labour available to him. "Best to have it in family," he said, "three slow hands can lose you a mornin's maarket."

Walking out with him over the adjoining fields—he had four of 8–10 acres—he showed us the field from which in the back-end the rhubarb now being forced had been lifted after having grown there and been untouched, "allowed to rot back," for three full years. The roots are lifted in great clods of earth which are put together in the sheds, to form the large beds we had seen. Another field lay fallow waiting to receive the roots from the sheds after forcing, when in say March or April they would be taken out, each root split into two or three pieces with a spade, cutting away old wood the while, and planted at about a yard apart, in both directions, to reach three-year maturity once more.

Needless to say we came away with a nice little lot of our own picking, turgid and tender. When I can, I hope to buy a rhubarb farm for myself, not so much for the regular return and strictly seasonal nature of its demands, but as the "set" for my full-length colour production—*Vegetable Farm*.

* * *

No visitor to London should leave without seeing the beautiful and legendary fountain in Queen Square. As the sun sinks majestically behind the sombre walls of Examination Hall, a cascade of silvery droplets bring shimmering ripples to the crystal pool, within its setting of luxuriant trees, lawns, and flower beds. This is the sacred shrine to which a whole empire pays homage, for there can be no other greatness in this world but that which springs from here. And as learned people in their thousands come on their perennial pilgrimage, so this historic spot has become eulogised by a popular song of the times. Even today, this song, written in the days when examination fees were paid in coins and the number of candidates rarely exceeded three, is still hummed in the most frequented haunt of young men about town:

"Three coins in the fountain,
Each one yearning for success—
Only good luck is wanted—
Which one will the Censors bless.
Make it mine, &c., &c."

There is a superstition that he who throws a coin into the fountain and wishes may have one wish fulfilled, but this is a common fallacy. The true legend, of course, affirms that the sacrifice of a coin to the waters of Queen Square ensures your return twice within each year for many years to come.

* * *

We too suffer from cat-hole-induced draughts. At one time we supposed this bracing climate to be the reason for the reluctance of some of our friends to visit us, but it has lately been explained to us that those who have not been hardened by a course of anatomy do not appreciate another side of life with *Felis domestica*. The domesticity of the creature is at best superficial; he leads an interesting double life, spending his non-sleeping hours hunting. Those who share his house are privileged to admire his large and varied kill which includes rabbits, weasels, moles, rats, mice of several kinds, shrews, birds, slow-worms, toads, and newts. Not all are eaten, but if he so chooses he is a swift and superbly competent dissector. In five-and-a-half minutes a half-grown rabbit is consumed, and *all* that is left is a clean neat pile of intestines. How many of our surgeon colleagues could accomplish a similar feat given, say, a sheep and the same instruments?

* * *

It really is rather exciting to slip off the tightly fitting skin of the country G.P. and to emerge a Londoner, a lady of leisure, and a frequenter of First Nights.

As usual it was an effort to get away. My 32-week primip had a show, a baby on the new estate had diarrhœa, and my odd-job woman rang up to say that she was expecting to be expecting. However, once in the train "show" took on a new meaning, bowels and babies were forgotten, and I began to feel as, presumably, a lizard feels when it begins to shed its skin. Tea, toast, and gossip at the club followed by the ritual of dressing for the opera completed the transformation. Supper was at six, because they won't let you in at Covent Garden if you are late. For a moment I felt my old skin slipping back when I found I was sitting next a patient, but conversation moved in safe channels. We talked of the composer and of the birth pangs of his opera, until I began dumbly to realise that the seven-year pregnancy ending tonight was something outside my ken. An hour later, seated on one of those little gilt chairs high above the stage, I marvelled at the greatness of the child now being born, and that, with three thousand others, I could watch, listen, and wonder, and need do nothing save applaud. 10.30 and it was over. At the reception we shook hands with the composer, met friends, gazed at celebrities, ate a little, drank a lot, and relaxed. Then the club and bed. Next morning Waterloo and the West and my G.P. skin looming near.

Anyhow it was good while it lasted. It was fun to be a first-nighter. It was intriguing to meet the great face to face, but to be present at the birth of an opera is not exactly a rest-cure. Give me my multips with hypertension, my primips with twins, my retained placentas even. I do know where I am with them. But last night I was out of my depth and I know it. Perhaps I wasn't the only one.

* * *

Our anæsthetist's small daughter ran impetuously down the garden path to fling herself into his waiting arms. She tripped over a stone and went tumbling to the ground.

"Daddy kiss it better," she sobbed, and this simple remedy certainly worked wonders.

"Did you make lots of people better to-day?" she asked, when the flow of tears had subsided. Not without modesty, he answered in the affirmative.

"And did you kiss them all?"

Letters to the Editor

THE HOSPITAL STAFF

SIR,—The Medical Committee of this hospital has discussed your editorial of Jan. 1 and has prepared the following memorandum on the appointment of senior staff, based on five years' experience of the working of the present regulations.

We would draw attention to the *Lancet* editorial of Jan. 1, 1955, and would answer its question—" are the members of hospital staffs really given enough say in choosing their new colleagues ? "—with an emphatic " no ! "

It is a truism that a hospital is to be judged by the calibre of its staff. Anything that will help to secure the selection of the ablest candidates for consultant posts who can work together and so develop that esprit-de-corps which is the soul of a hospital should be encouraged.

Those most keenly interested in the quality of new members of the staff are the staff of the hospital itself. Clearly, then, the Medical Staff Committee should play an important part in the selection of new staff members.

Under the existing regulations, the Medical Staff Committee as such has no part in the selection of new senior staff ; and any of its members who may be appointed to a selection committee are appointed by the courtesy of the Hospital Management Committee (who at this hospital have been most coöperative) or, more rarely, by the Regional Board.

Thus one, or exceptionally two, members of the medical staff sit on a committee of eight or ten to select a colleague with whom they will have to work for twenty-five to thirty years. The candidates often have never been seen before by the staff members concerned, and a decision has to be made on one's impression of the candidate as he appears before the committee for a few minutes. There is no adequate opportunity for reflection and none for consultation with one's hospital colleagues after the candidates have been seen, before a vote has to be cast.

It is suggested that the regulations be amended to ensure (1) that representatives of the Medical Committee be invited, *as of right*, to sit on the selection committee ; and (2) that the Medical Committee or its representatives be given an opportunity to interview the short-listed candidates some time before the final appointing committee meets.

M. LUBRAN
Chairman of the Medical Committee,
West Middlesex Hospital.

INSTITUTION AND SERVICE

SIR,—I entirely agree with the late Sir James Spence that what really matters is the quality of the *institutions* through which the National Health Service is provided ; and particularly that a hospital should be an institution, as he defined it, carrying out its functions with the close personal collaboration of all those involved—or what, in another kind of jargon, is often called an organism. But I wonder whether your leader of Jan. 1, in leaning away from bureaucracy, does not fall into the opposite danger of self-satisfied anarchy. Many believe that Central Government's proper part in the National Health Service is simply to provide the money and then let other and better people get on with the job of spending it. But the Royal College of Physicians' evidence which you quote says that the activities of the medical institutions making up the service need " coördination and sometimes leadership " ; and for my part I suspect that they need, if not leadership, then at least electric shocks from Central Government rather more often than might be supposed.

To illustrate this point rather crudely, let me refer to the axiom so often stated in hospital circles that of course the patient comes first. To me it has often seemed that when this has been said the subject is regarded as dealt with and the patient is promptly forgotten. Would a visitor from Mars, looking at the way outpatients have been, and still are only too often, handled in outpatient departments ; or at the rules for visiting, particularly of children, to which there is still strong opposition ; or at the daily routine of a patient's life in a hospital ward with its early waking and all the rest of it—would, I say, a visitor from Mars, seeing all this, really believe that all these various activities had been planned on the assumption that the patient comes first ? Whatever the answer may be, they are all points in which the public takes a lively interest and in which Central Government is therefore, willynilly, bound to take a hand. This does not, of course, mean regulations or detailed control, or prior approvals, or anything of that sort ; but equally it does not mean standing aside and leaving the institutions to find their own salvation.

In the later part of the leader you ask " has the morale of some hospitals been unnecessarily weakened by the grouping system ? " My own answer would be " yes, in some cases it has." But against this I would put the fact that some hospitals which ought, as individual entities, to be dead, are still alive as such. Probably we should all agree that in some places wrong groupings have been made, with bad results ; but there are probably at least as many where grouping should have resulted in hospitals either becoming branches of a main institution or being closed altogether.

On the answer to your second question " do members of hospital staffs get enough say in choosing their colleagues ? " opinions differ. On the one hand one hears of outsiders being imposed on hospital staffs, and on the other hand one hears of outsiders having no chance against the local favourite.

Thirdly, you say : " should not administrators remember that the good offices and good will of the medical staff are essential for a good hospital ? " Yes indeed : but I would ask you to consider two points. The first is : has not the medical staff (or perhaps it would be fairer to say the medical profession) made this much more difficult by its insistence on representation on every hospital board and committee ? There is a lot to be said for the argument that hospital medical staffs would be in a much better and even in a much stronger position if they were not members of the managing bodies, and if representatives of the medical staff attended the meetings without the right to vote. The second point is whether again the medical profession has not done the individual non-teaching hospital considerable harm by its insistence that consultants and other senior members of the medical staff must be appointed by and employed by the regional boards and not the management committees. In my own personal view, no single provision of the National Health Service Act has done more to break up the old corporate identity of the individual hospital.

LAYMAN.

PERFORATED PEPTIC ULCERS

SIR,—Mr. Grieve, in his letter of Feb. 5, criticises two points in my conclusions about the treatment of acutely perforated peptic ulcer.

The first is that patients seriously ill as the result of the perforation might do as well with conservative as with operative treatment, provided that the resuscitative measures were equally vigorous. I must confess that I did not make it clear, as he points out, that the 3 patients who died under conservative measures also received what was thought to be adequate resuscitative measures, and responded temporarily. No doubt, also, the 56 seriously ill patients reported in the literature also received resuscitative measures (although this is nowhere made clear), but 54 died. It seems that the cause of death is the peripheral circulatory failure, from the gross peritoneal flooding in the early case and from toxæmia of the peritonitis and the fluid loss of paralytic ileus in the late case, and I think that the essence of treatment in

these cases is the peritoneal toilet; the resuscitative measures are to make the patient fit for this, the actual suture of the ulcer being a secondary consideration. I feel that I did not, perhaps, make this clear in the paper.

Mr. Grieve's second point was that the conclusions from table IV are too general for the data given: in particular, that the ranges of mortality are wide (from 0 to 20%), that the various series do not appear to be identical, and that ages are not given. It is known, of course, that the longer the perforation, the older the patient, and the more chronic the ulcer, the worse is the prognosis. Series are bound to be dissimilar unless each consisted of a very large number of cases, so that mortality is also bound to vary according to the types of cases admitted (I am supposing that the skill of the surgeons in reported series will be about equal). Therefore, it seems that the only way to arrive at a result which will approximate to all ulcers dealt with, is by taking an average of all reported series during a roughly approximate period (with, in particular, antibiotics in mind). This I have attempted to do, and I do not think that further data would be of help; indeed such data would unduly complete the tables.

Leeds. H. D. MOORE.

CHLORPROMAZINE AND GASTROSCOPY

SIR,—Dr. Morton Gill's letter in your issue of Feb. 5, though confirming the anti-emetic property of chlorpromazine, reveals an amazingly high incidence of retching and vomiting in outpatients recently subjected to gastroscopy. I never meet this sequel, but I deal only with inpatients. It is unlikely that such effects could be explained on the difference between inpatient or outpatient status. It would be of interest to know whether Dr. Gill uses opium or morphine in the preparation of his patients. Many gastroscopists do, I believe, use morphine, thus giving a false impression of gastric tone, and all too often encouraging retching and vomiting.

London, W.1. A. H. DOUTHWAITE.

HARDENED FATS AND LUNG CANCER

SIR,—Even the most tentative suggestions that appear in the medical journals concerning possible causes of diseases are eagerly taken up by the lay press and reported as medical opinion, often with wide and sometimes with harmful repercussions. If for this reason alone, Mr. Nyrop's [1] attempt to connect margarine consumption with lung cancer cannot be allowed to gain currency, based as it is on inaccurate data.

Mr. Nyrop concludes from experimental data that the essential fatty acids (E.F.A.) are apparently necessary in the body's defence against carcinogens. This is problematical at the best, but he then proceeds to state categorically that hardened fats (an ingredient of margarine, shortenings, and some confectionary) are almost free from E.F.A., and therefore our diet is relatively deficient in them and we are consequently more susceptible to lung cancer.

Professor Yudkin (Jan. 1) has already pointed out the incorrectness of Mr. Nyrop's conclusions with regard to the connection between E.F.A. and carcinogens, and that moreover deficiency of E.F.A. rarely, if ever, occurs in man. Mr. Nyrop argued (Jan. 29) with this last point; but he did not, and cannot, argue with the essential fact that margarine contains more E.F.A. than butter. He simply stated, contrary to analytical data: "it is well known that hydrogenation of fats eliminates E.F.A." Firstly, this is not true. Shortening hardened non-selectively (as used in baking) contains about four times as much E.F.A. as butter; and even shortening hardened selectively (as used in frying) contains approximately the same amount as butter.[2] Secondly, margarine never contains more than 50% of hardened fats and often less than this, the remainder being other vegetable oils of which, for example, cotton-seed contains fifteen to thirty times as much E.F.A. as butter.

Mr. Nyrop suggested that the increase in margarine consumption at the expense of butter has reduced our intake of E.F.A., but the fact is that it has actually increased the E.F.A. in our diet. An average margarine contains twice as much E.F.A. as does butter [2]; and this means, from the consumption figures quoted by Mr. Nyrop,[1] that the E.F.A. intake has increased by about 40% since 1936. Any arguments as to the possible correlation with lung cancer are therefore completely invalid.

Bovril Limited.
148, Old Street, London, E.C.1. A. E. BENDER.

1. Nyrop, J. E. *Lancet*, 1954, ii, 1288.
2. Deuel, H. J., Greenberg, S. H., Anisfoeld, L., Melnick, D. *J. Nutr.* 1951, **45**, 635.

TUBERCULOSIS IN IMMIGRANTS

SIR,—Dr. Doig's letter (Jan. 15) with its factual data gives an informative and revealing picture of tuberculosis in Lewis; clearly he has good grounds for postulating that many emigrants from the island are already infected before leaving home.

We think he will agree, however, that in our paper [3] we made no attempt at an appraisal of the situation in Lewis a hundred years ago, at the present time, or at any time, but that it was concerned with immigrants from Ireland. Based on that experience we did suggest that routine B.C.G. vaccination of tuberculin-negative school-leavers should be undertaken in the Scottish Highlands and Islands (and in rural Wales) earlier than in other parts of Britain; and we note with pleasure that in Lewis tuberculin-testing on a considerable scale, with vaccination of negative reactors, is indeed being carried out—apparently with good effect, to judge from another communication from Dr. Doig.[4] We hope that his example will be speedily emulated in other similar areas.

Dr. James (Jan. 29) asserts, without presenting factual evidence, that the high incidence of tuberculosis in Irish immigrants to England is also due to the "minimal undiscovered lesion which they take with them, or to reinfection in England."

We would not deny that where infection has occurred in Ireland, progression under the more arduous conditions of life in Britain is likely to lead to breakdown; we did indeed say that "breakdown arising from relapse or recrudescence of an earlier infection is one way in which clinical tuberculosis may arise in a susceptible Irish immigrant," and that "no doubt the altered environment and additional strain of life in the poorer quarters of a big city accelerated breakdown." But surely this is not the whole story; the report of the National Tuberculosis Survey in (Southern) Ireland [5] has made it abundantly clear that the level of tuberculin-positivity in rural districts is low. This observation is confirmed by other studies.[6,7] Dr. James himself quotes Flynn and Joyce,[8] who found only 14·5% positive at age 18. What of the remainder? Those authors say that our estimate of the 15–25-year age-group entering Britain in the tuberculin-negative state may be too low and that "the problem of the tuberculin-negative immigrant may be somewhat greater." They further indicate that nearly 60% of 121 patients with pulmonary infection between 15 and 34 years of age had resided in an urban area in Ireland, Great Britain, or abroad. Is it likely that the majority of these patients were infected *before* leaving home when the level of tuberculin-positivity is so low? Experience with Irish nurses would seem to indicate otherwise. The Prophit survey [9] established that, whereas of Irish nurses tuberculin-positive on entry 17·9 per 1000 observation years developed tuberculous lesions, of those tuberculin-negative on entry 55·2 per 1000 observation years developed tuberculous disease. In other words, the tuberculin-negative Irish nurse produced the bulk of the lesions—which surely confirms our contention that the tuberculin-negative migrant experiences the greater risk and provides more cases of disease.

3. Hess, E. V., Macdonald, N. *Lancet*, 1954, ii, 132.
4. Doig, R. S. *Brit. med. J.* 1954, ii, 1357.
5. Report of the National Tuberculosis Survey. Dublin, 1954.
6. Burke, P. J. *Brit. med. J.* 1951, ii, 887.
7. Price, D. S. *Irish J. med. Sci.* 1952, p. 85.
8. Flynn, M. P., Joyce, J. C. *Tubercle*, 1954, **35**, 270.
9. Tuberculosis in Young Adults. London, 1948.

Tuberculin positivity or negativity in an Irish migrant, however, is not the final determinant as to whether he or she will later develop tuberculous disease.

If we may again quote Wallgren [10]: "Natural resistance is of greater importance for the subsequent course of tuberculous infection than acquired specific immunity." We stated that the probability is that many migrants have a low level of natural resistance because "Ireland did not experience the peak of its epidemic wave of tuberculosis until much later than England." Dr. James thinks that here we go "seriously astray" and finds our argument "difficult to follow." But we produced—we believe—sufficient evidence that the Irish immigrant broke down with tuberculosis more frequently than the native English city dweller. This, we think, is the crux of the matter—"the level of resistance of a community is proportional to the amount of tuberculosis it has experienced." In other words, the breakdown-rate is fundamentally dependent on the level of *natural* resistance; and this is determined, not by race, but by the tuberculous experience of previous generations.

So far as rural Ireland is concerned this experience is considerably less than that of London or other cities; hence there are likely to be more susceptibles amongst the rural Irish. If such susceptibles are infected before they leave Ireland they are, because of low inherited resistance, likely to break down more commonly than their city contemporaries who are more inured to the disease; this breakdown is liable to occur, however, irrespective of the locality where infection is acquired. Although the available evidence regarding the high level of tuberculin-negativity in rural Ireland suggests that infection after emigration must be the more frequent, the possibility of individual breakdown with disease in either instance is equally high. We adhere, nevertheless, to the suggestion put forward in our article—that B.C.G. vaccination of tuberculin-negative Irish immigrants with provision of a follow-up scheme in Britain should be seriously considered. We would add that this follow-up scheme should also include the tuberculin-positive Irish immigrant; for this group also contains susceptibles.

Dr. James raises other points.

Progressive primary tuberculosis in adults may be extremely uncommon in Northern Ireland, but in England there is evidence to indicate its prevalence; resection specimens give abundant proof. [11 12] Pleural effusions do occur in persons who have been tuberculin-positive for many years, but only too frequently are they the sequelæ of primary infections in adolescents and young adults; superinfection remains an unknown quantity; and regarding the lack of evidence from the Dominions and U.S.A. of a high incidence of disease in immigrants from rural Ireland, we suggest that this may not have been sought; in any event the numbers are much smaller.

Clare Hall Hospital, South Mimms, Barnet. EVELYN V. HESS NORMAN MACDONALD.

VICARIOUS APPETITE

SIR,—There is a small group of English words which have one meaning for ordinary people and another quite different meaning, with no support from etymology or dictionaries, for doctors only. Examples are confabulate (talk together, not invent a story) and homonymous (having the same name, not having the same boundaries).

This group ought to be diminished, and it is a pity that Dr. Muir, in his instructive and entertaining letter of Feb. 5, should seek to enlarge it by the addition of the word vicarious. When I read the heading "vicarious appetite" I took it to refer to someone who felt hungry on behalf of someone else, and read on in hope of learning how such a thing could happen. That, I submit, is the only way in which any ordinary person could take the phrase. It cannot mean an appetite for unnourishing substances instead of food, and still less an appetite for one food to the exclusion of others. This new usage, if it were accepted, would be the more confusing because in our medical vocabulary we already have an example of correct usage, namely vicarious menstruation (the performance of the function of menstruation by structures other than the uterus).

What is wrong with "perverted appetite"?

London, S.W.20. JOHN PENMAN.

SIR,—Why vicarious (in Dr. Muir's letter last week)? The patient is not satisfied by someone else eating the food. Why not capricious? Or eclectic?

Bonar Bridge, Sutherland. DONALD MCGREGOR.

VENEREOLOGY AND DERMATOLOGY

SIR,—Administrative convenience has prevailed and a dermatologist has been appointed in East Kent to a post in which several of the sessions are in venereology. It was not the fault of the successful candidate that this was made a dual appointment and we wish him well in his difficult task.

In the interests of the registrars working in our two departments it is most important for us to know whether this policy has come to stay. If so, we must start to train our registrars both in dermatology and in venereology no matter to which department they have been appointed. It is only in this way that they can become eligible for any future dual appointments. They will have to face a difficult future in which they must try to become as efficient as their full-time colleagues in both of these very different specialties.

AMBROSE KING
The London Hospital, E.1. BRIAN RUSSELL.

MANIPULATION AND CERVICAL SPONDYLITIS

SIR,—In all the recent communications in your columns on the subject of cervical spondylitis, it has been stated that treatment by manipulation is contra-indicated.

In common with most of my orthopædic colleagues I treat a large number of these cases by manipulation, and have been doing so for the last twenty years with increasing frequency owing to the favourable results obtained. Often they are repeat manipulations performed at the demand of the patient, and I do not remember any case in which there was evidence that structural damage had been caused.

I believe this unfortunate conflict of opinion is due to two factors. First, the neurologist tends to see these cases in their early stages when the disc is softened and "pulpy" and liable to prolapse, causing pressure on cord or nerve-roots, whereas the orthopædic surgeon sees the late cases when the tissues of the disc have been largely absorbed and a secondary traumatic arthritis has developed with associated symptoms of root irritation. In the early cases manipulation is nearly always inadvisable and could cause serious damage, whereas in the late cases there is no disc tissue capable of prolapsing and the procedure is safe and often dramatically effective.

Secondly, the neurologist will naturally see the bad results of inadvisable or inexpert manipulation but not the good results, since they do not require his services.

To the orthopædic surgeon manipulation does not mean a forcible wrenching but gentle and precisely gauged movements performed under manual traction and with the muscles completely relaxed, which is best achieved by the *rapid* administration of a small dose of intravenous thiopentone. It should be carried out with the greatest caution in early cases, especially when neurological signs of root or cord pressure are present, and when the disc spaces are not markedly narrowed. Even then it should only be done if an adequate period of rest has been ineffective and operation is being contemplated.

It is safe in late cases when the joint spaces are narrowed and arthritic changes have developed, when there is little actual stiffness, no neurological signs, and

10. Wallgren, A. *Acta. tuberc. scand.* 1954, **28**, 155.
11. Pagel, W., Simmonds, F. A. H., Macdonald, N. Pulmonary Tuberculosis. London, 1953; p. 170.
12. Pagel, W., Nassau, E. *Tubercle*, 1951, **32**, 120.

no guarding muscle spasm. There are thus two paradoxes: the more advanced the radiological changes the safer does manipulation become; and the less the stiffness the greater the likelihood of benefit accruing.

Those who say that manipulation has no place in the treatment of cervical spondylitis should bear in mind that if manipulation is denied to them under expert guidance, patients will inevitably seek help from the unqualified practitioners, for they know that manipulation can help. They do *not* know that it can also be disastrous.

Guy's Hospital,
London, S.E.1. T. T. STAMM.

INFLUENZA

SIR,—I was very interested in your topical discussion last week on influenza as seen in general practice this winter. In support of the general trends which you have noted I would like to add the experiences of my own practice of approximately 5000 patients in South-east London.

Whereas the North and the West had their epidemics in November and December, we in this area are only just recovering from our share which began in early January and reached its peak in the third week of that month.

It must be said at the outset that the figures I have collected are based solely on clinical findings—i.e., sudden onset, variable fever, generalised aches and pains, painful eyes, and symptoms referred to the respiratory tract. As you point out in your leader last week, the differential diagnosis of upper respiratory tract infections, including influenza, is in a state of flux and chaos and it is often clinically impossible to distinguish between the common cold, febrile catarrh (or A.R.D.), and influenza. My figures may therefore be liable to give too high an incidence by inadvertently including some of the other common viral infections of the upper respiratory tract. Another factor which may give a wrong picture of the total incidence is that not all patients suffering from this condition consulted me for their symptoms, and some cases may have been missed, tending to counterbalance the first possible error. Moreover, we are all aware of the fact that serological tests now exist for the diagnosis of influenza, but unfortunately during an epidemic there is little time to carry these out. It is known however that in the past two months, during the course of an investigation into acute chests in general practice, some cases of influenza B, proven serologically, were seen in this area, so it is known that the virus has been active. One last point about the diagnosis of influenza: it should only be made during an epidemic, and when applied to sporadic cases the label is usually incorrect.

Between the end of December and early February 150 cases of influenza were diagnosed in my practice. The age-distribution is shown in the accompanying table. The sex-distribution was equal. As in the Gloucestershire practice you quote, the maximal incidence was in children below 10. This I have found unusual, for in the two previous influenza-A epidemics in 1950 and 1953 there were few cases in children, the greatest number of cases being in young and middle-aged adults.

AGE-DISTRIBUTION OF INFLUENZA CASES

Age ..	0–1	1–4	5–9	10–19	20–29	30–39	40–49	50–59	60–69	70+
No. of cases	2	16	23	18	21	22	28	17	10	4
% of those at risk ..	2	5	7	3	2·5	2·5	3	3	2·5	2

Clinically this epidemic has been on a lesser scale than those two already mentioned. The acute stage lasted as a rule from two to four days with a relatively low incidence of "post-influenzal debility."

It was rather difficult to be certain whether the chest complications were directly attributable to the influenza, but during this same period there occurred 15 "acute chests" which were probably related to the epidemic. This gives a 10% incidence of chest complications. It is of some interest to compare this, and the types of complication, with those in the two previous epidemics (see table).

COMPLICATIONS

Year of epidemic and type of virus ..	1950 A	1953 A	1955 B
No. of cases	233	264	150
Chest complications	43 (20%)	29 (12%)	15 (10%)
Acute bronchitis	6 (3%)	12 (5%)	4 (3%)
Pneumonia with clinical consolidation	4 (2%)	4 (2%)	4 (3%)
Pneumonia with no clinical consolidation	33 (15%)	13 (5%)	7 (5%)

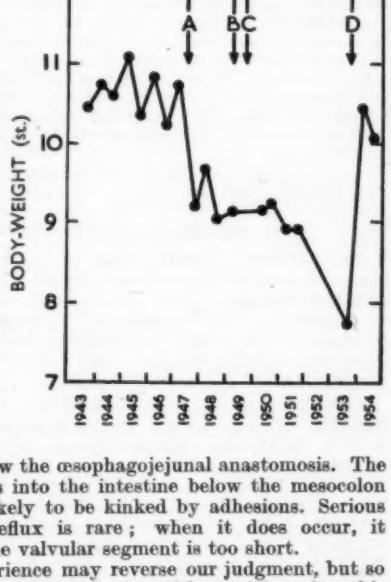
These are of course small numbers, and definite conclusions should not be drawn too readily; but the figures are in many respects remarkably similar, showing a fairly constant proportion of complications and somewhat similar clinical types. This suggests that, contrary to the common belief that influenza B is a milder illness than type A, the incidence of chest complications is much the same in the two types. This viewpoint is also shared by Professor Stuart-Harris.[1]

Beckenham, Kent. JOHN FRY.

TOTAL GASTRECTOMY

SIR,—Your leading article of Jan. 29 is in conflict with our experience. In your words, a patient "may not become a frank invalid" after total gastrectomy but "he will no longer be the man he was"; there is an implication that the operation should be more or less reserved for malignant disease; and finally it is suggested that œsophagoduodenostomy is the anastomosis of choice.

Surely this is the worst of choices. Admittedly satisfied patients write letters and it is the dissatisfied ones who haunt us; but even if we allow for this, some discomfort after this operation seems to be the rule, and in the worst cases tryptic œsophagitis may make a patient almost suicidal. He refuses to go to bed and tries to sleep sitting upright. Anastomosis of the œsophagus to a loop of jejunum, with or without entero-anastomosis, gives no better result. The modern operation is a Roux-Y with the loop carrying the duodenal secretions inserted at least 18 in. below the œsophagojejunal anastomosis. The side loop drains into the intestine below the mesocolon where it is unlikely to be kinked by adhesions. Serious trouble from reflux is rare; when it does occur, it suggests that the valvular segment is too short.



Further experience may reverse our judgment, but so far there has been less difficulty with nutrition after this operation than after many subtotal gastrectomies. The accompanying weight chart belongs to a patient who had recurrent ulcers after a gastroenterostomy; a partial gastrectomy (A), a subtotal (B), and a vagotomy (C)

1. Stuart-Harris, C. H. *Brit. med. J.* Feb. 5, 1955, p. 348.

were all unsatisfactory. After total gastrectomy (D), his weight returned within four months to its average level before the first partial gastrectomy, and no-one would suspect from his present healthy appearance that he had ever been seriously ill. Another patient who had a Roux-Y three years ago now needs a reducing diet! In both patients the hæmoglobin is keeping normal.

We do not lightly suggest either total or subtotal gastrectomy and our present operation of choice for a high gastric ulcer is to disregard the small possibility of carcinoma and do a partial gastrectomy below the ulcer (with bad ulcers this seems easier than "fashioning" stomachs). So far there has been no trouble in a small series followed up for periods up to five years. For severe recurrent ulceration on the other hand, or for bad ulcers associated with a hiatal hernia, total gastrectomy is well worth considering. Trouble also arises from lack of postoperative supervision. It is easier to prevent disturbances of function than to cure them. For many gastrectomy patients sugar is almost a poison. Meals should be dry and compact, and fluids with or just after should be forbidden. Patients must also be warned of the danger of laxatives, tonics, cough medicines, cures for rheumatism, &c.

J. E. RICHARDSON
DENYS JENNINGS.

The London Hospital, E.1.

CHILDREN'S HOSPITAL TO BE CONVERTED?

SIR,—Thank you for your annotation on the proposal to convert the Princess Louise Hospital. As a member of the medical staff of that hospital I cannot now comment upon the objections and recommendations that our medical staff committee has put forward: these have yet to be considered by the board of governors of St. Mary's Hospital; they will at the same time be considering further the third report of the coördination subcommittee (chairman, Mr. H. N. Sporborg) which contains the recommendations for conversion and all that follows therefrom. From your annotation I would like to take up some points of wider application.

You suggest that the question of children's beds in London should be reviewed as a whole. A reading of all the reports of the Sporborg committee suggests that the Ministry has prompted the board of governors, out of all the questions of coördination that may exist within a large and diverse group, twice to examine "the pædiatric problem." I suggest that what exists is a problem of insufficient adult beds, but that official prompting has led to this being called a pædiatric problem. The bases of this prompting seem to be two-, or even three-, fold.

(1) In 1944 the Goodenough report suggested that, for teaching purposes, the best proportion of pædiatric beds is 10% of all teaching beds. At that time this seemed a very high figure, but I and several of my colleagues now feel that it is too low. Yet even now the integral and affiliated children's beds in London teaching-hospital groups total less than 10% of all teaching beds. There is thus no justification for converting the Princess Louise Hospital or for discontinuing the pædiatric teaching there. Indeed, I believe it would help students if there were more pædiatric teaching beds.

(2) It has been said that the demand for children's beds is decreasing, that waiting-lists to children's hospitals are falling, and that delays in admission to children's hospitals from waiting-lists is less than for adults in some instances. Assumptions like these appear in the third Sporborg report, but little supporting evidence is put forward. Your annotation, which finds them convincing, goes on to suggest that children's beds can safely be reduced in London; but Spence and Taylor [1] implied in their estimate that London would need more than the 50 beds per 100,000 of the population that Newcastle requires, and the factors favouring an economical use of beds in Newcastle do not all apply in London. The St. Mary's scheme for the home care of seriously ill children, shortly to be extended to the Kensington area, is still but a research project. In a "bad" winter it is still extremely difficult to find hospital accommodation for children, and in a "good" summer attempts both to reduce tonsillectomy waiting-lists and to fill vacant beds by extra or increased operation-lists may be frustrated by an epidemic of poliomyelitis, which stops all such operations. There must be enough children's beds to meet emergencies: in particular, more cubicle and mother-and-child accommodation is urgently needed, and this can best be provided by children's hospitals, which are larger than the children's wards of general hospitals. Bed occupancy in the summer may be low; waiting-lists may fall and rise; comparison with adult beds and waiting-lists is in no wise fair. It was shortage of adult beds in St. Mary's Hospital group that led eventually to this third report of the Sporborg committee; but the pædiatric problem, if it exists, can be solved only by the growth, change, or diminution of the pædiatric services, and not by subserving to the need for adult beds. A solution to the shortage of adult beds must surely be found within the sphere of adult medicine and surgery (especially surgery, since surgical waiting-lists are the longest); and if need be more accommodation should be provided.

(3) The suggestion has been made that it is official policy to encourage the development of children's wards in general hospitals and discourage separate children's hospitals. This may be a misinterpretation of the desire that children's units should develop in close association with general hospitals (while remaining self-contained in administration and staff, both nursing and medical) so that they can easily call on specialised services of the parent hospital for help. From my own experience I would say that children's units work best when they have their own ancillary services for everyday needs: radiographic services in children's hospitals produce work that is incomparably better done than where the staff is not continually dealing with children; and children treated by those who are used to them behave more often as reasonable beings than when their gods, the adults, are ailing round about them.

Related to this third point is the desire of the General Nursing Council that children's wards should be maintained in those general hospitals that train nurses for State registration. This argument in the case of St. Mary's Hospital and the Princess Louise Hospital is complicated by the fact that a sick children's nurses training-school, approved by the General Nursing Council, is established between this hospital and the Paddington Green Children's Hospital, which will be closed if the Sporborg committee's recommendations are implemented. Where affiliation of a children's unit to the general hospital is strong, what is to prevent some of the nursing being done by trainees of the general hospital? They will, I believe, learn more about the care of sick children by association with nurses and students devoted solely to pædiatrics than in a ward where the junior staff are all, like themselves, going the rounds of the general hospital.

The controversial nature of these basic assumptions by the authorities should make us think most carefully before it is agreed to close a specialised children's hospital whose record of service to the Royal Borough of Kensington goes back to 1840.

Orpington, Kent. J. WESTON WELLS.

SIR,—The view that anyone takes on the question of the conversion of children's hospitals for the use of adult patients will depend very much on his general conception of what the hospital service should be like.

It is the duty of the Minister of Health to provide hospital accommodation for the whole population to the extent he considers necessary to meet all reasonable requirements. This duty has been passed on to the regional hospital boards, but some of these bodies seem to lack clear ideas about the way in which this duty should be discharged, or the way in which it should be passed on to the organisations and individuals in immediate contact with the people. The uncertainty must be to a great extent due to different traditions in the different types of hospitals in the country. Before the National Health Service the voluntary hospitals were essentially selective and specialised, while the

1. Spence, J. C., Taylor, M. D. *Lancet*, 1954, i, 719.

local-authority hospitals (whatever their limitations may have been) were comprehensive. For them the qualification for admission was need, whereas the voluntary hospitals which were groups of specialised units were concerned only about cases appropriate for treatment in these units. The local-authority hospital undertook all the general duties left over.

There are thus two main conceptions of a hospital: (1) a comprehensive institution looking after the needs of human beings in a locality; and (2) a group of specialised units.

It must be admitted that the comprehensive hospital has been out of favour since the introduction of the National Health Service Act, but there are some indications that the alternative has not proved entirely satisfactory. The paper on Institutional Medicine, from the posthumous papers of Sir James Spence, which you published and commented on in your issue of Jan. 1, stresses the danger of hospitals becoming mere "services" instead of "institutions." An institution is defined as "the establishment and arrangement of human effort towards a common end."

If the common end is the providing for the hospital needs of complete human beings it can be most easily reached by means of comprehensive hospitals. Regard for the unspecialised needs of human beings was formerly one of the most important duties of medical superintendents. It is disturbing to learn from the Bradbeer report that it is no longer considered to be a part of medical administration. We read "it is primarily the matron and her nursing staff who create the comfort, the content, and the 'atmosphere' of the hospital and who can most influence the feelings with which the general public regard it. The matron is the personal link between the community and the hospital."

I hope the medical profession will retrieve this duty as quickly as possible.

The community in the main still consists of families, and it is difficult to dissociate the hospital needs of individuals from their family circumstances. These needs can be most easily met by comprehensive hospitals. Such hospitals should contain units for the main specialties, including an obstetric department with a closely linked pædiatric unit.

Specialised children's hospitals will be advocated by university departments, and clearly they have some advantages for pædiatric education and research; but these activities, important as they are, are not the primary duties of the Minister in the hospital service.

In any large hospital it is difficult to avoid undertaking the care of some children for various reasons: if there is no pædiatric unit in the hospital, first-rate facilities for treating them are unlikely to be present. If there is a large children's hospital in a region there will be pressure to prevent the establishment of pædiatric units in the general hospitals. Specialised children's hospitals are difficult and expensive to administer and usually have to struggle hard to maintain a sufficient nursing staff. No doubt a case can be made for maintaining a few special children's hospitals, but I do not think they should be regarded as part of the normal pattern of the hospital service.

Liverpool. HENRY H. MACWILLIAM.

SIR,—Your annotation of Jan. 29 draws attention to the general diminishing demand for children's beds.

Many children's hospitals and children's wards were founded and endowed by people anxious to be of service to children. They have been staffed by doctors and nurses imbued with the same tradition of service towards the child. Their management committees are drawn from people with particular interest in the child. While there is a need in the children's field it would be a misfortune to disband these sympathetic and generous forces concerned with the welfare of the child.

I point to the lamentable need throughout the country for children's units for the inpatient treatment of the nervous child. Pædiatric and psychiatric interest is focused more and more on this group of children, and clinical experience shows the need for short-stay inpatient units, of which there are still very few in this country. A small proportion of delinquent reactions, sometimes associated with emotional disturbances, in children are probably best dealt with elsewhere; but the greater proportion of emotionally disturbed children can be adequately investigated with very little adaptation of present accommodation.

Child Psychiatry Clinic,
11, Fore Street, Ipswich. J. G. HOWELLS.

SIR,—It was with some misgivings that I read in your annotation of the scheme to convert the Princess Louise Hospital for Children to adult use. I was in 1949 a resident at the other children's hospital in the St. Mary's group—Paddington Green—and I recall very clearly how a similar situation arose. At that time a medical committee, produced a plan for the conversion of that hospital for adult E.N.T. cases—a plan remarkable for its architectural infeasibility and disregard of local needs. I hope history is not going to repeat itself too precisely.

Should, however, there now be real difficulty at the Princess Louise in keeping all its beds tenanted, I wonder whether the idea has been considered of converting a block of wards into a psychiatric unit for children. The need for children's psychiatric inpatient care, in relation to the places available, must far exceed the demand for adult medical or surgical beds, great even as this is. This scheme would at least have the advantage of leaving intact the character of the Princess Louise as a children's hospital, of giving a teaching hospital a unique advantage in showing to its students cases of this kind, and of presenting an opportunity of linking more closely the two rather estranged specialties of child psychiatry and pædiatrics.

Maida Vale Hospital,
London, W.9. C. H. NEVILLE-SMITH.

IMPOTENCE

SIR,—Dr. Tuthill's article (Jan. 15), while a fresh approach to the subject, does not explain how he would treat acquired impotence where initially the husband was not impotent. I should welcome his explanation of this on physiological grounds.

Infertility Clinic, Victoria Memorial
Jewish Hospital, Manchester. B. SANDLER.

GEOGRAPHY OF GENERAL PRACTICES

SIR,—As reported in your issue of Jan. 15, the medical officer of health for Middlesbrough in his report for 1953 seems to deplore that all the general practitioners in the town spend time motoring from one end of the town to another, and to suggest that this should be prevented by the application of a nice tidy dose of administrative medicine, confining certain doctors to certain streets, and certain streets to certain doctors.

Quite apart from the fact that such a step would interfere with the freedom of choice of doctor, it should not be too readily assumed that the few minutes spent driving in a car between patients' houses is wasted time. It affords the practitioner a few moments for reflection and relaxation (or, at any rate, a change of occupation) and, for those still uninhibited in the matter of tobacco, a soothing cigarette. It is, in fact, a sort of diastole in the practitioner's daily activity, and as such, should not be too hastily condemned.

West Byfleet,
Surrey. S. J. HADFIELD.

ISOBEL CRIPPS CENTRE

IN reply to Mr. Neil (Feb. 5), Dr. Barlow writes: "I should like to point out that one of the two advertisements I mentioned appeared in a daily newspaper a few months ago, not in 1950."

Obituary

ALBERT ERNEST HAMERTON

C.M.G., D.S.O., M.R.C.S.

Colonel Hamerton, a former assistant director of pathology at the War Office and for many years pathologist to the Zoological Society, died on Jan. 31 at Brighton at the age of 81.

His father, the Rev. Thomas Hamerton, had a charge in Leeds, and he was educated at Leeds Grammar School and the University of Leeds. After qualifying in 1899 he held the appointment of R.M.O. at Leeds Public Dispensary before joining the R.A.M.C. In 1903 he was promoted captain and the following year, for his services at the action of Jidtalli in Somaliland, he was awarded the D.S.O. In 1908 he was appointed to the Sleeping Sickness Commission of the Royal Society, and he worked for the commission in Uganda and Nyasaland till 1914.

From the beginning of the war he served in France in charge of a cavalry field ambulance, later at a casualty-clearing station. He was promoted lieut.-colonel in 1917 and appointed C.M.G. in 1918. While serving with the Mesopotamian Expeditionary Force from 1920 to 1922 he was in charge of the Central Laboratory and Pasteur Institute at Bagdad. In 1923 he returned to this country to take up an assistant directorship at the War Office. He retired in 1928, and in the same year he was appointed pathologist to the Zoological Society.

Prof. Edward Hindle, to whom we are indebted for particulars of Hamerton's work at the Zoological Gardens, points out that he brought to his new post both a wide experience of medical research in many countries and the interest of a keen naturalist in the animals. The Zoological Society of London was the first organisation of its kind to make a practice of holding a necropsy on every animal dying after being added to the collection. The annual reports from the prosectorium, dating from the middle of the last century, are a valuable record of the diseases prevalent in the collection, and the eighteen reports by Hamerton are a mine of information. He also prepared a catalogued index of all the microscopical slides of pathological specimens of animals brought to the prosectorium, in which the diagnosis of the cause of death had been confirmed by at least two other experts besides himself.

Apart from his routine work, his most important contribution was a study of the condition known as cage paralysis which was first recognised in the London Zoo in 1935. This disease is confined to Old World monkeys, and was found to be the result of primary myelin degeneration of the spinal cord, with continuous demyelinisation of the white matter from the cervical to the lumbar region. He showed that the disease seemed to be associated with a dietary deficiency and responded to treatment with liver extract (*Brain*, 1942, **65**, 193). He also described another fatal disease of monkeys, pulmonary acariasis, caused by a mite *Pneumonyssus semicola* infesting the lungs of captive wild monkeys. His other studies included the distribution of tuberculosis among the animals and the diseases of aviary birds. As a result of his work at the Zoological Gardens he modified the views which he put forward in the Royal Society's commission on sleeping-sickness in 1913 and no longer advocated the extermination of wild animals as a method of controlling the tsetse-fly. He became convinced that, in view of our limited knowledge, the destruction of big game was to be deplored and he became a strong advocate of nature protection. Among all these activities he found time to provide many institutions and research-workers with helpful advice and anatomical and pathological material from the prosectorium. He finally retired in 1946.

ROBERT LISTER HORTON

M.S. Lond., F.R.C.S., J.P.

Mr. Lister Horton, consulting surgeon to the Dorset County Hospital and the Weymouth and District Hospital, died on Jan. 23 at his home at Bournemouth.

He was born in 1889, the son of Dr. Thomas Horton, of Torquay. From Mill Hill School in 1907, he entered University College where he won the Bucknill scholarship. In 1912 he qualified from University College Hospital, taking his M.B. the following year. After holding house-appointments at his hospital he took the F.R.C.S. in 1914. The same year, on the outbreak of war, he joined the Royal Army Medical Corps, and for his services in France as a surgical specialist he was mentioned in despatches. After the war he returned to University College Hospital as surgical registrar and tutor to dental students. In 1920 he took the degree of M.S., being awarded a gold medal.

In 1922 he settled in general practice in Weymouth. He also built up a surgical practice and joined the staffs of the Weymouth and District Hospital, the Dorset County Hospital, Bridport Hospital, and Herrison Mental Hospital. During the late war military and civilian casualties greatly added to the burden of his work. These strenuous years told on his health, and after the war he gave up some of his appointments and moved to Bournemouth. But he continued work at Bridport and Herrison Hospitals until a few months ago. He had been appointed a justice of the peace for Dorset in 1938.

D. J. R. S. writes: "Horton was one of a body of able men who, between the wars, carried on the long-established tradition of good doctoring in south Dorset. He was trained as a surgeon and he carried the promise of a brilliant student career into the full fruition of an extensive surgical practice. His abundant energy enabled him to engage in a considerable amount of private general practice. He was, thus, one of the diminishing band of doctors, unfettered by narrow specialism, whose medical knowledge was truly wide and whose value to the community was thereby immeasurably enhanced. His outstanding operative skill was based on full anatomical knowledge, beautiful 'hands,' and the judgment born of applied experience. Every movement brought the end of the operation visibly nearer—there was no time for fiddling or showmanship. We have lost a dear friend, a man who never made an enemy. His memorial will be enduring gratitude and affection in the hearts of the people of Dorset."

Mr. Horton married in 1917 Miss Elizabeth MacDonald, R.R.C. She survives him with a son and a daughter, who is also a doctor.

GRACE MARY LUKOSE

M.B. Lond., B.Sc. Madras, F.R.C.S.

Miss Grace Lukose, formerly assistant professor of surgery at the Lady Hardinge Medical College, New Delhi, died on Dec. 26, at the age of 36, after an accident.

She first came to England in 1938, having graduated B.SC. at Madras University, and entered upon the second year of preclinical study at the London School of Medicine for Women, where her mother, Dr. Mary Poonen-Lukose, who was surgeon-general to the government of Travancore, also qualified.

She graduated M.B. in 1946, after holding several unqualified house-appointments, in which her aptitude for surgery became evident. On her return to India she worked at the Lady Hardinge Medical College, New Delhi, for two years, and in 1949 she came to England on postgraduate study leave and lived at Canterbury Hall in Bloomsbury until she took her F.R.C.S. in 1951. Soon after her return to India in 1952 she was appointed assistant professor at the Lady Hardinge Medical College. Last autumn she had a severe illness, diagnosed as rheumatic fever, from which she was making a slow but steady recovery. She returned to her mother in Travancore, where in an attempt to help a relative whose hair had been caught in an electric fan, she received the electric shock which caused her death.

"It was during the years," writes K. M. L., "when she lived at Canterbury Hall, that many of us had an opportunity of recognising Grace Lukose's unique qualities, and catching some of the gaiety of her infectious laughter. Singularly free from any self-consciousness she quickly made friends, and entered into every aspect of university life. No-one could be more jealous than she was for the position and dignity of medical women, nor more loyal than she to her friends and to the institutions to which she gave her affection."

Sir EDWARD MELLANBY

Prof. H. N. Green writes of the personal qualities which made Mellanby a world leader in scientific medicine.

"He combined a powerful direct mind with an almost instinctive sense of what were the really important problems. Having decided on a line of research he pursued it with

astonishing zeal and single-minded devotion which never flagged until the answer was obtained or was deemed unattainable. I can recall so many such occasions, but one example will here suffice. Before he left Sheffield he had become engrossed in studies on tumour respiration and the effects of toxic substances on it. After leaving to live in London he and his wife came to Sheffield every weekend for several years to continue this work—the first train up on Saturday morning and the last back on Sunday evening, with the interval filled in assembling and recording the manometers of the Warburg apparatus.

"Like most great seekers after truth he was essentially a modest man and all his achievements and honours sat on him lightly. He only showed vanity, and that mainly in an impish sense, when in private he scoffed at those administrators who took the credit for health measures derived entirely from the arduous labours of medical scientists. He always maintained that people with a gift for making discoveries should be given every facility to work as the spirit moved them and that directed research by committee ruling was a pompous waste of effort.

"His greatest contribution to medicine was undoubtedly the impact of his nutritional discoveries on preventive medicine. The discovery of vitamin D alone not only removed an outstanding cause of deformity but helped in the steady reduction in infantile morbidity and mortality. Though he rarely commented on this, I think of all his achievements, this was the one which gave him the greatest quiet satisfaction.

"For his dedicated life no-one could have been more fortunate than Sir Edward in having such splendid help from his wife. She took much of the laboratory and all of the domestic administration on her shoulders and was an active colleague in all his purely scientific work. With all this she carried out extensive investigations of her own in which he played little part except that of admiring interest. Her great companionship and zeal for work, equal to his own, was undoubtedly a big factor in his success, for it spurred him to effort over those dull patches of successive negative results which assail all investigators and sometimes make them flag. The story of this lifelong scientific partnership is a grand one and perhaps some day it will be told."

Sir Arthur MacNalty writes:

"When I became chief medical officer of the Ministry of Health in 1935, Edward Mellanby was one of the first people I consulted as to ways and means of promoting the ministry's medical work. He did everything he could to help me, and the closer relations between the Medical Research Council and the Ministry date from that time. Especially did I value his advice in promoting the Ministry's campaign for immunisation against diphtheria which has met with such remarkable success. On countless other questions he helped and advised. When the second world war came, our consultations were more frequent and together we planned the Emergency Public Health Laboratory Service which was such a boon to national public health. Later, at my request, he joined the editorial board of the *Official Medical History of the War*, and by his nomination of Dr. F. H. K. Green and Sir Gordon Covell as editors of the volume on medical research enabled an adequate account of the council's war work to be recorded. I miss a true friend and a great scientist."

Sir Charles Lovatt Evans recalls that it was a surprise to many when "this sharp-spoken, quick-witted and able research-worker, who appeared to be somewhat of a recluse," was given the appointment of secretary to the Medical Research Council.

"But under Mellanby's guidance," he continues, "the influence and achievements of the council developed enormously, and he grew with it. He was a great man, not only by reason of the distinction of his research work, but even more by his encouragement of the work of others. He had an amazing grasp of the multitudinous researches, and of the many research-workers under the council's ægis, and always remembered them, and had their interest at heart. He was of wise counsel, shrewd in the appreciation of men, and forthright in the expression of his beliefs. Not the least of his outstanding characteristics was the tenacity with which he continued his own research throughout the tenure of his heavy administrative position, working in his laboratory, with his wife, through the weekends, to return, apparently refreshed, to his desk on Monday. There can be no doubt that genuine devotion to his research was among the first things in his life."

Prof. JAMES WHILLIS

WRITING on behalf of the consultants, registrars, and visitors who meet at Stoke Mandeville Hospital every Monday to discuss their problems of construction, reconstruction, and repair, T. P. K. gratefully recalls Whillis's monthly visits to the group.

"Only illness or the pressing call of one of his other extramural activities was allowed to cancel the visit, yet Stoke Mandeville Hospital, Aylesbury, is roughly forty miles northwest of London, and Whillis lived at Seal near Sevenoaks some thirty miles south of the Metropolis. It was a measure of the value he placed on these visits that he was prepared to arrive at the hospital mid-morning and only leave to travel by train via London with the expectation of reaching home about midnight. These visits were to us a means of keeping us on the right lines anatomically and functionally, and to him a link with the clinical applications of his specialty, and indeed with clinical matters in general. Our apologies to his wife for this imposition were always considered unnecessary because she knew how much her husband enjoyed these visits. He would watch operations until lunch and spend the whole afternoon in the clinic where outpatients and inpatients were freely and fully discussed. To these discussions he always contributed much sage advice and his presence was as invigorating as a breath of fresh air. If time allowed he would round off the session with a "lecturette" on some anatomical subject of our choice before we carried him off to dine with us in Aylesbury, hear one of those yarns he told so well, and reluctantly see him to his train.

"Everyone who met Whillis was fascinated by his boyish (almost puckish) outlook; all who knew him developed for him a deeply affectionate regard. He had many friends and surely no enemies. We shall remember him as the man with the articulated finger bones in his pocket, always ready to demonstrate the disturbances of function so commonly seen in the burnt finger, and as that rare teacher who could make anatomy live and embryology understandable. We shall keep on remembering (and missing) him in a thousand and one ways, but most of all for his warm and loyal friendship."

Appointments

BARTLETT, T. T., M.R.C.S.: S.H.M.O., Mount Pleasant Hospital, Chepstow.

FENTON, G. I., M.B. Belf., F.R.C.S.I.: consultant orthopædic surgeon, headquarters in Londonderry.

NIGHTINGALE, DOREEN, M.S. Lond., F.R.C.S.: consultant thoracic surgeon, University College Hospital, London.

POLLOCK, MARGERY A., M.B. Dubl., F.F.A.R.C.S., D.A.: consultant anæsthetist, South Belfast H.M.C.

ROBERTSON, J. D., M.D. Edin., M.R.C.P.E., F.F.A.R.C.S., D.A.: whole-time consultant anæsthetist, regional pool of anæsthetists, based on Royal Infirmary, Edinburgh.

South-Western Regional Hospital Board:

BARNETT, A. F., M.D. Lond., M.R.C.P.: senior medical registrar, Plymouth clinical area.

GORDON, ALEXANDER, M.B. Edin.: registrar, department of pathology, Frenchay Hospital, Bristol.

VILLET, D. DE G., M.B. Cape Town, F.R.C.S.: surgical registrar, Gloucestershire Royal Hospital, Gloucester.

Welsh Regional Hospital Board:

DAVIES, D. G. H., M.R.C.S., F.F.A.R.C.S., D.A.: consultant anæsthetist, Newport and East Mon. H.M.C.

JENKINS, R. E., M.B., D.P.M.: asst. psychiatrist (S.H.M.O.), Morgannwg Hospital, Bridgend.

JONES, G. MARTIN, M.R.C.S.: senior casualty officer, based at St. Tydfil's Hospital, Merthyr Tydfil.

JONES, J. G. P., M.D. Lpool, M.R.C.P., D.C.H.: deputy medical superintendent (S.H.M.O.), Llangwyfan Hospital, near Denbigh.

Colonial Medical Service:

CARSON, H. M., M.B. Dubl.: S.M.O., Ministry of Health, Gold Coast.

LOMAZ, JOZEF, M.B. Polish School of Medicine, Edinburgh: M.O. (anæsthetist), Federation of Malaya.

READ, M. T., M.B.E., M.C., M.R.C.S., D.T.M.&H.: administrative M.O. (grade A), Federation of Malaya.

RUSSELL, H. B. L., M.R.C.S., D.T.M.&H., D.P.H.: S.M.O., ministry of health, Gold Coast.

Births, Marriages, and Deaths

BIRTHS

CAMPBELL.—On Feb. 6, at St. Brenda's Nursing Home, Bristol, to Mary (née Clarke), wife of Dr. A. M. G. Campbell—a daughter.

DEATHS

HORTON.—On Jan. 23, at 119, Queen's Park Avenue, Bournemouth, Robert Lister Horton, M.S. Lond., F.R.C.S., J.P., aged 65.

Notes and News

WORLD HEALTH ORGANISATION

THE Executive Board of W.H.O., at its meeting in Geneva, has outlined its proposed programme of work for the period 1957–60. The aims are to secure the participation and coöperation of all countries and territories; to stimulate research and the exchange of knowledge in health science generally; to assist governments in developing their health services; and to promote coöperation between neighbouring countries and those with common problems. Under this programme all countries will be encouraged in long-term national health planning; the professional and technical education of national health personnel is to be fostered; and in countries unable to provide full professional services, W.H.O. will assist in training "subprofessional" workers and medical ancillaries.

The board, expressing concern over reports that malaria-bearing mosquitoes are developing resistance to dicophane (D.D.T.), resolved to ask the World Health Assembly to urge governments to intensify their plans for malaria control. Figures submitted to the board revealed that over 300 million persons in the free world are still unprotected against malaria. The board recommended that total malaria eradication should replace malaria control, even though this would involve a temporary increase in expenditure.

INTERLINGUA

BEGINNING with the January issue, *Circulation* is including summaries of articles in Interlingua. In the U.S.A. altogether nine scientific publications, including *Blood*, now use Interlingua as a secondary language; and two further publications appear in Interlingua exclusively. This language is composed of elements common to Spanish, Portuguese, French, Italian, and other Romance languages.

A NEW CHILDREN'S WARD

CHILDREN are on the whole keeping fitter than they used to do, with the result that children's hospitals, and even children's wards, are becoming scarcer. But at the Hospital of St. John and St. Elizabeth, in St. John's Wood, London, the Sisters of Mercy believe that a hospital without a children's ward is not complete. They had one before the war, but when the children were evacuated, the ward had to be turned to other urgent uses, and it was not possible to revive the old use in the hard times that followed. But now a new ward, specially built for the purpose, was being opened on Feb. 9, by the Cardinal Archbishop of Westminster. St. John's and St. Elizabeth's is a voluntary hospital, so the money for this project has had to be collected; and contributions have ranged from £3500 from King Edward's Hospital Fund for London to a farthing collection from the children of the neighbourhood. It has cost £27,000—nearly half what the entire new buildings cost in 1898, when the hospital moved to its present site from Great Ormond Street. Only £5000 more remains to be found.

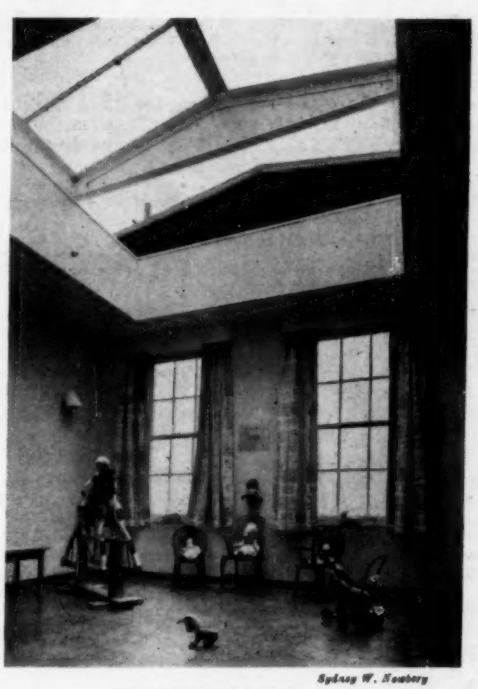
The new ward has been built on the top of one of the wings of the old building, with its floor mounted on a steel frame and its flat roof made of corrugated aluminium, for lightness. The double-hang sash windows let in plenty of light, and allow of permanent ventilation without draughts. The ceilings are suspended and the floors are of Spanish cork tiling, warm, quiet, and pleasant to look at.

The main ward consists of two four-bedded bays, the cots being so arranged that the occupants can fling remarks to each other but not droplet infections. The sick child, as Sir James Spence used to remind us, looks up at a ceiling which often seems terribly far off and frightening: but here the ceilings are of reasonable height and painted a colour misleadingly called "buttercup yellow," though in fact it is a particularly winning deep primrose. White or soft grey-blue walls set off this colour, and curtains of charming pattern rest the eye. The ceilings are set with lamps in gracious fluted shades, and even the screens, curtained in a faint indian red, add unobtrusively to the clever subdued colour-scheme. At night, lights set low in the wall behind small slatted grilles send a different light downwards to the floor, lighting the way for nurses but never dazzling a patient's eye. The cots are made with bars too close together for even the smallest inquisitive head to poke through; but the cot sides are still as heavy as they have always been for nurses to move. When are equipment designers going to produce a labour-saving cot? Mattresses, either interior-sprung, or 'Dunlopillo,' are enclosed in waterproof plastic cases. Six cots have poles to carry transfusion fittings, and bed trays with open corners for easy cleaning, hang from the cot sides.

An infants' ward, with canvas cots, is warmed by electric panels in the ceiling which maintain it at a constant convenient heat in any weather. Elsewhere the unit is warmed by plentiful radiators running beneath the windows and round the walls. There is a two-bed isolation ward, with a large glass observation window, and a glass screen separating the beds. It has its own water-closet and wash-basin, and is also fitted with a cupboard opening both into the corridor and into the ward, through which food or necessary equipment can be passed without need for the person outside to enter the ward. Two small wards contain single beds big enough to take a grown-up person. These will be useful when a mother and baby are admitted together.

The treatment room is of the most modern pattern, with a refrigerator for blood, a telescopic lamp on an adjustable arm, a sink and slabs for plaster-making, and a special ventilating plant which can be switched on to remove sterilising vapours. It will also serve as a recovery room for children coming round from anæsthetics. Equipment is of stainless steel wherever possible, and all appropriate surfaces are covered with 'Warerite.' Two sluice-rooms are fitted with mechanical bed-pan washers. The kitchen contains a large refrigerator and a small electric cooker. Food is to be brought to the ward in an electrically heated trolley which is so slung on its chassis that it travels up and down ramps without ever deviating from the horizontal—a great safeguard against the slopping of soups. The doctor's room has an X-ray viewing panel, a cabinet for records, and a handsome scale for weighing the patients: like the rest of the unit it also has a friendly and welcoming air.

The most unusual room in the unit is the playroom. It is empty, as a playroom should be, except for toys; and thanks to hot-water panels set high in the walls it is warm. Moreover it has a splendid outlook over the hospital gardens, and its windows are so arranged that nobody can fall out of them. Its distinctive feature, however, is the roof: this is of glass, and movable. Press a button, and the roof steadily and soberly slides off out of sight, leaving the whole playroom open to the sky; press another button and back it comes with engaging precision. The sisters consider that in this way they have solved the problem of providing both an indoor playroom and an outdoor playground, both at treetop level.



Sydney W. Newbery

The playroom, with sliding roof.

NEW RULES FOR MIDWIVES

THE Minister of Health has now authorised the use by midwives of trichloroethylene [1]; and the Central Midwives Board has approved the following apparatus for its administration:

1. Tecota Mark 6 (made by Cyprane Ltd., Haworth, Keighley, Yorks.).
2. Emotril Trichloroethylene Automatic Inhaler (made by the Medical and Industrial Equipment Ltd., 12, New Cavendish Street, London, W.1).

The board stipulates that the apparatus shall be used by a midwife on her own responsibility only if it has been inspected and approved by the board within the previous six months. The apparatus must be inspected periodically by the manufacturers, who will arrange with the board for the issue of the requisite certificates. Before employing the apparatus each midwife must satisfy the board that she is thoroughly proficient in its use.

The new rules provide that midwives shall from time to time attend refresher courses approved by the board.

LABORATORY SERVICE IN EMERGENCIES

THE Ministry of Health suggests that throughout the country the services of a hospital pathological laboratory should be available in emergency, both to hospital medical staff and to general practitioners, at times when laboratories are normally closed. In some places, according to the Ministry, the arrangements for emergency service are inadequate, whereas in others an undue burden is being placed on laboratory staffs. A memorandum to hospital authorities [2] defines two types of emergency service: (1) guaranteed; and (2) contingent (i.e., the hospital will do its best to carry out the test provided that it can reach the pathologist or technician concerned). For the guaranteed service hospitals should, wherever possible, be grouped together, each taking it in turn to provide this service. Hospital authorities are asked to prevent unnecessary use of the emergency organisation, which should not be more elaborate than is required to meet likely demands.

Royal College of Physicians of Edinburgh

At a meeting of the college held on Feb. 1, with Dr. L. S. P. Davidson, the president, in the chair, the following were elected to the membership:

G. J. Summers, A. Muir, D. P. Puri, L. E. Wynter, S. Bell, A. K. Black, M. B. Morris, J. A. Kay, I. M. Cuthill, D. C. Peiris, T. S. Kalyanam, P. S. Macfarlane, H. M. P. Perera, F. V. Edrisinghe, D. M. Chakraborty, V. Srinivasan, P. M. Hewlett, G. F. Trobridge, B. Kaplan, E. D. Myers, M. S. Karve, H. S. Wong, T. A. Cunningham, D. C. Sen, F. O. Simpson, C. G. Caro.

Chadwick Lecture

On Monday, Feb. 14, at 5.30 P.M., at the Royal Institution of Great Britain, 21, Albemarle Street, London, W.1, Sir Hugh Beaver, M.INST.C.E., will give a lecture on Clean Air.

London County Council

The council has agreed to increases in the salaries of its chief officers which will cost £7500 a year.

The salary of the clerk of the council rises from £4700 to £5000, those of the chief engineer, the architect, and the education officer from £4200 to £4500, and that of the medical officer of health from £4000 to £4250.

Basingstoke Plastic Centre Medical Society

On Thursday, Feb. 17, at 7.30 P.M., at Rooksdown House (Park Prewett Hospital), Basingstoke, Hants, Sir Harold Gillies will take the chair at a symposium on Fractures of the Long Bones with Soft-tissue Loss. The speakers will include Prof. J. Trueta, Mr. J. S. Ellis, Mr. A. J. Evans, and Mr. E. W. Peet.

St. Mark's Hospital, London

On Jan. 29 the medical committee of the hospital gave a dinner in honour of Prof. J. C. Goligher's appointment to the chair of surgery in the University of Leeds and also of his appointment as honorary consulting surgeon to St. Mark's Hospital. In the course of the dinner his successor, Mr. Ian P. Todd, was welcomed. A toast was also drunk in absentia to Mr. J. P. Lockhart-Mummery, the senior honorary consulting surgeon to the hospital, who is now living in Hove and will be celebrating his 80th birthday on Feb. 14.

---

1. The Midwives Rules, Approval Instrument, 1955. S.I. 1955, no. 120.
2. H.M. (55)14.

Diary of the Week

FEB. 13 TO 19

Monday, 14th

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.2
4 P.M. Sir Cecil Wakeley: Hunter and Surgical Research (Hunterian oration).

MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1.
8.30 P.M. Dr. W. G. Oakley, Mr. S. M. Cohen: Diabetic Gangrene.

Tuesday, 15th

UNIVERSITY OF LONDON
5 P.M. (University College Hospital Medical School, W.C.1.) Prof. Jan Waldenström (Lund): Clinical Investigations in Hypergammaglobulinæmia.

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1.) Prof. J. N. Davidson: Nucleoproteins in Cell Structure.

ST. MARY'S HOSPITAL MEDICAL SCHOOL, Paddington, W.2
5 P.M. Prof. D. E. Price: Gynæcological Pathology.

INSTITUTE OF DERMATOLOGY, St. John's Hospital, Lisle Street, W.C.2
5.30 P.M. Dr. H. J. Wallace: Bullous Eruptions.

SOUTH WEST LONDON MEDICAL SOCIETY
8.30 P.M. (Bolingbroke Hospital, Wandsworth Common, S.W.11.) Prof. Alan Moncrieff: Marasmus.

MANCHESTER MEDICAL SOCIETY
4.30 P.M. (Medical School.) Dr. G. E. Smith: Medical History of Dr. Johnson. (University lecture.)

Wednesday, 16th

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
8.15 P.M. *General Practice, Dermatology.* Dr. Ray Bettley: Industrial and Domestic Dermatoses; Dr. Bernard Peck: Teaching of Dermatology for General Practice.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. Henry Haber: Clefts, Vesicles, and Bullæ.

EUGENICS SOCIETY
5.30 P.M. (Burlington House, Piccadilly, W.1.) Mrs. Judith Hubback: Fertility of Educated Women.

Thursday, 17th

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.1
5 P.M. Prof. W. Melville Arnott: Order and Disorder in Pulmonary Function. (First Oliver-Sharpey lecture.)

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine.) Prof. J. H. Gaddum, F.R.S.: Effects of Alcohol.

ROYAL ARMY MEDICAL COLLEGE, Millbank, S.W.1
5 P.M. Dr. W. H. Bradley: Man and Virus.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, Manson House, 26, Portland Place, W.1
7.30 P.M. Colonel H. W. Mulligan: Trypanosomiasis in British West Africa.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. R. W. Riddell: Diagnosis of Fungous Infections.

BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck Street, W.1
8 P.M. Dr. A. Robinson Thomas: Technique of Sialography. Mr. R. T. Payne: Experiences of Sialography.

MANCHESTER MEDICAL SOCIETY
8 P.M. *Anæsthetics.* (Medical School) Dr. T. H. Chadwick: Anæsthesia for Prostatic Surgery.

UNIVERSITY OF ST. ANDREWS, Medical School, Small's Wynd, Dundee
5 P.M. Mr. Andrew Logan: Benign Ulceration of the Œsophagus.

Friday, 18th

POSTGRADUATE MEDICAL SCHOOL OF LONDON, Ducane Road, W.12
2 P.M. Mr. D. M. Wallace: Natural History of Bladder Tumours.
4 P.M. Prof. C. H. Stuart-Harris: Virus Diseases of the Respiratory Tract.

UNIVERSITY COLLEGE, Gower Street, W.C.1
5.30 P.M. Prof. F. Bergel, D.SC.: Attempts at Chemotherapy of Malignant Diseases.

ROYAL SOCIETY OF MEDICINE
8.15 P.M. *Radiology.* Mr. F. P. Raper: Bilateral Symmetrical Peri-ureteric Fibrosis. Dr. P. G. Keates: An Assessment of Sodium Acetrizoate and an Experimental Basis for its Use in Intravenous Pyelography.

FACULTY OF RADIOLOGISTS, 45, Lincoln's Inn Fields, W.C.2
5 P.M. *Radiodiagnosis.* Dr. David Sutton: Thoracic Aortography by Percutaneous Transcarotid Catheterisation. Dr. Conway Don: Intravenous Cholangiography after Cholecystectomy.

INSTITUTE OF NEUROLOGY
5 P.M. (National Hospital, Queen Square, W.C.1.) Prof. G. J. Romanes: Motor Cells of the Spinal Cord.

OSLER CLUB
7.45 P.M. (11, Chandos Street, W.1.) Dr. A. W. Spence, Sir James Paterson Ross: History of Acromegaly.

ROYAL MEDICAL SOCIETY, 7, Melbourne Place, Edinburgh, 1
8 P.M. Prof. J. Chassar Moir: Confinements of Some English Queens and their Effects on History.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW
242, St. Vincent Street, Glasgow.
5 P.M. Mr. Iain McLennan: Surgical Aspects of Thyroid Disease.

Saturday, 19th

BIOCHEMICAL SOCIETY
11 A.M. (London School of Hygiene and Tropical Medicine.) Symposium on the Biochemistry of Vitamin B_{12}.

Time off for allergy?

Many thousands of working hours are lost throughout the year because of allergic disorders. Much of this loss in efficiency and production is preventable. Allergy rarely causes complete prostration but even so, the discomfort caused to patients is usually enough to reduce their efficiency whether they are housewife, office worker, or the man who works in a factory. When symptoms of allergic or sensitization reactions limit the patient's activities, treatment with one of the **M&B** brand antihistaminics is indicated. In most cases these drugs provide rapid and effective control of the distressing symptoms and enable the patient to resume a normal life.

Supplies: **'Anthisan'—50 and 100 mgm. tablets; elixir containing 25 mgm. per 3·6 c.c. (approx. 1 teaspoonful); solution for injection; and cream. 'Phenergan'—10 and 25 mgm. tablets; elixir containing 5 mgm. per 3·6 c.c. (approx. 1 teaspoonful); solution for injection; and cream incorporating dibromopropamidine isethionate.**

*** Please note that these products are available in *two* strengths of tablets.**

'Anthisan'
trade mark *brand*
MEPYRAMINE MALEATE
THE GENERAL-PURPOSE ANTIHISTAMINIC

'Phenergan'
trade mark *brand*
PROMETHAZINE HYDROCHLORIDE
THE ANTIHISTAMINIC WITH A PROLONGED ACTION

MANUFACTURED BY **MAY & BAKER LTD**

M&B *brand Medical Products* MA.2240

DISTRIBUTORS: PHARMACEUTICAL SPECIALITIES (MAY & BAKER) LTD · DAGENHAM · ESSEX

Gentle reminder. In the ritual of antisepsis there can be no relaxation. In the operating theatre, in the labour ward, in the first-aid post, 'DETTOL' is a constant reminder that the greatest triumph over infection still lies in its prevention.

synthomycetine

(Chloramphenicol)

Lepetit

Milano (ITALY)

An antibiotic with a very wide range of antibacterial action

WHEN PRESCRIBING CHLORODYNE
medical men should be particular to specify

Dr. J. Collis Browne's CHLORODYNE

The Original and only genuine Chlorodyne

used with unvarying success by the Medical Profession in all parts of the world for over **100 YEARS**

Always insist on "Dr. Collis Browne's"

THERE IS NO SUBSTITUTE

When it's a case for Elixir Ferrous Gluconate

simply write

GLIRONA

on your E.C.10

A formulation which does not throw out and deposit and which has remarkably little tendency to oxidation.

In each teaspoonful :-

Ferrous gluconate	0.3 G.
Vitamin B_1	1 mg.
Vitamin B_2	1 mg.
Nicotinamide	10 mg.
Traces of manganese and copper	

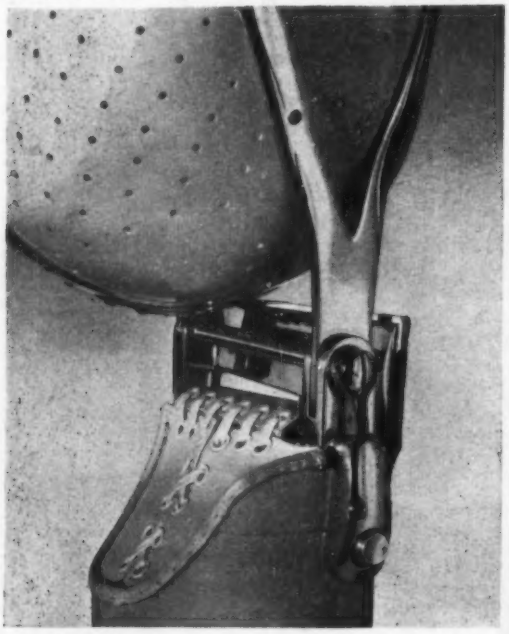
Bottles of 4 fl. oz.

When Elixir Ferrous Gluconate without vitamins is required you can supply GLISTRON

HARKER STAGG LTD.

EMMOTT STREET, LONDON, E.1 STEPNEY GREEN 2022

SERVICE TO THE LIMBLESS



HANGER Hip lock for artificial limbs for amputation of the leg at the hip operated by the finger-tip.

CRAFTMANSHIP

At Roehampton, The HANGER Organisation, for long the fount of experience in the limbmaking industry, employs nearly one thousand craftsmen (many of whom are themselves disabled) in the manufacture of Light Metal and Willow artificial legs. Most of these men have spent their working lives in this special vocation, and the result of this long and specialised experience is the HANGER LEG, acknowledged the world over as the finest example of the leg maker's craft, and which for over 40 years has been approved and prescribed by the leading authorities in Orthopædics. Fully equipped and expertly staffed Fitting Rooms are established at every Ministry of Health Limb Fitting Centre in the United Kingdom, and the HANGER Organisation is represented in nearly every overseas Capital. Literature and any special information required will be gladly sent on request.

HANGER
ARTIFICIAL LIMBS

J. E. HANGER & CO. LTD
ROEHAMPTON · LONDON, S.W.15

34

'THANK YOU, NURSE— THAT'S JUST WHAT THE DOCTOR ORDERED'

Bourn-vita . . . made with malt, cocoa, milk, sugar and eggs . . . to persuade the mind to shelve its problems and the body to relax into deep, untroubled sleep.

sleep sweeter Bourn-vita

From
CADBURYS
Factory-in-a-Garden

THERE'S NEVER BEEN A SOAP LIKE WRIGHT'S

For 50 *years awarded the*

CERTIFICATE OF MERIT

of the Royal Institute

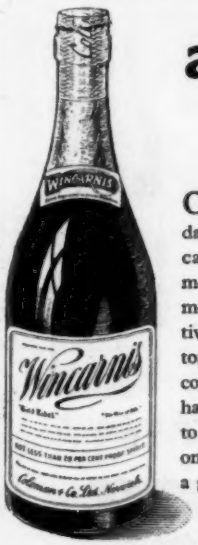
of Public Health and Hygiene

Research in raw materials and germicides, with constant modernization of mechanical production, ensures the continually improving quality demanded by the Certificate.

Ideal for Toilet, Bath and Nursery

WRIGHT'S

COAL TAR SOAP



a good wine

On the question of whether or not a daily glass of good wine can in many cases be of real benefit to health, medical opinion is by no means unanimous. But those who hold the affirmative view can be sure of this: that among tonic wines none can be more safely recommended than Wincarnis. Its makers have a very real sense of responsibility to the thousands who look on the name Wincarnis as a guarantee of goodness.

WINCARNIS

The trusted tonic wine

Wincarnis **RED LABEL** **10/6** : Half Bottle **5/9**

Strength 26° proof spirit

Wincarnis **GOLD LABEL** **15/6** : Half Bottle **8/3**

Strength 28° proof spirit

Cut costs with this

UNBREAKABLE 'ATLAS' NYLON SYRINGE

(Made in England)

Produced after 5 years development

Here, at last, is a syringe that is proof against almost any accident! The "Atlas" syringe, precision-made of tough, translucent nylon, cuts replacement costs and, because barrels and pistons are interchangeable, saves time too!

Other special features:

- All-in-one barrel and nozzle: no leaks—quick, easy cleaning, complete hygiene.
- Leak-proof, smooth-working pistons never stick.
- Convertible immediately from Record to Luer fitting without adapter.
- Can be sterilised by boiling or autoclaving at 18 lb. steam pressure (120°C.).
- Does not affect the pH of solutions.

Available in sizes: 3 ml., 5 ml., 10 ml., 20 ml

Please write for descriptive leaflet with prices.

Chas. F. Thackray LTD

Head Office: THE OLD MEDICAL SCHOOL, PARK ST., LEEDS 1.
Tel: 20085 (5 lines) Cables: Aseptic, Leeds

London Office: 38 WELBECK ST., LONDON W.1. Tel. WELbeck 8152/3
Also at Cape Town and Johannesburg

IN PRACTICE
IT WORKS

- **Bismuth Carbonate**
- **Frequent Small Meals**
- **Adequate Sedation**

This régime has been proved by clinical investigation to relieve symptoms and effect rapid healing in cases of peptic ulcer. Bismuth carbonate in adequate dosage is unique in that it protects and soothes the gastric mucosa and at the same time effectively inactivates pepsin without unduly raising the pH.

Full illustrated literature and samples on request to

Bismuth Research Dept.
MINING & CHEMICAL PRODUCTS LTD.
86 STRAND, LONDON, W.C.2.

IMPROVED FORMULA

'LIVOX' CAPSULES

For the treatment of Anaemias, Nutritional Deficiencies, General Debility

NOW FERROUS GLUCONATE

FORMULA:

LIVER EXTRACT CONCENTRATE	2.5 grains
~~IRON GLYCEROPHOSPHATE~~	1.0 ,,
COPPER SULPHATE	0.01 ,,
MANGANESE SULPHATE	0.01 ,,
VITAMIN B_1	0.165 mg.
VITAMIN B_2	0.05 ,,
NICOTINAMIDE	~~0.5~~ ,,

NOW 5.0 mg.

OXO LTD (*Medical Dept*) THAMES HOUSE, LONDON, EC4
TELEPHONE: CENTRAL 9781

ONE MOMENT PLEASE, DOCTOR...

IT'S SOMETIMES difficult to make the mother of a family look after herself, but once she has sampled Ribena she will usually spare herself the time to take it daily.

First developed on a large scale to prevent Vitamin C deficiency during the war, Ribena is now recommended by doctors for a variety of conditions. Ribena contains pure blackcurrant juice, one of the richest sources of Vitamin C. Its content of glucose and fruit sugar comes from the same natural source, while its added cane sugar makes it acceptable to all palates.

If you would like a sample bottle of Ribena, and a copy of our brochure, "*Blackcurrant Juice in Modern Therapy*", please write to the Medical Dept. B/9, H. W. Carter & Co. Ltd., The Royal Forest Factory, Coleford, Glos.

Ribena contains as much as 45% actual blackcurrant juice, one of the richest sources of natural Vitamin C, with natural glucose and fruit sugar, sweetened with cane sugar.

The secret is to take
Ribena
daily

THE BLACKCURRANT JUICE
VITAMIN C HEALTH DRINK

The "CHIRON" HYGIENIC DISPOSABLE BAGS

(Pat. applied for 28788/51)

LIGHT NO ODOUR
SAVE DRESSINGS

*

For:

ILEOSTOMY

COLOSTOMY

CYSTOTOMY

TRANS-PLANTATION OF URETERS

ETC.

Also replaces Rubber Koenig-Rutzen Bag

*

ASK FOR CIRCULAR

DOWN BROS. and MAYER & PHELPS LTD.

Surgical Instrument Makers

32-34, New Cavendish Street, London, W.1

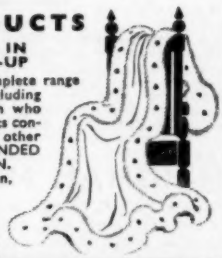
QUEEN

Non Allergic

BEAUTY PRODUCTS

THE SAFETY FACTOR IN EVERY DAY MAKE-UP

Queen beauty products form a complete range of toilet and beauty preparations, including lipsticks, specially for those women who have sensitive skins. Queen products contain no orris in any form, nor any other skin irritants AND ARE RECOMMENDED BY THE MEDICAL PROFESSION. Obtainable from John Bell & Croyden, 50 Wigmore Street, W.1, and other chemists.



Write for Price List to:—

BOUTALLS CHEMISTS LTD.

60 Lambs Conduit St., London, W.C.1

See EUROPE from an armchair

MEMORABLE TOURS BY LUXURIOUS MOTOR PULLMAN SALOONS & 1st CLASS MOTOR COACHES

Enjoy every minute of your tour through Europe, free from language and luggage worries. Armchair luxury, first class hotels, and every facility to make your holiday memorable. Escorted London back to London, conducted by the pioneers of luxury Motor Pullman Tours. Day travel only.

Tours arranged from 14 *to* 30 *days*
Inclusive outlays 56 *gns. to* 195 *gns.*

WRITE NOW FOR ILLUSTRATED BROCHURES giving full details of luxurious Motor Pullman and Motor Coach tours throughout:

BELGIUM · FRANCE · DENMARK ITALY · SPAIN · PORTUGAL GERMANY · HOLLAND · NORWAY SWEDEN · SWITZERLAND · YUGOSLAVIA · AUSTRIA · MOROCCO

MOTORWAYS

(Division W) 85 Knightsbridge, London, S.W.1 SLOane 0422 or Agents

TRAVEL WITH THE ALL-BRITISH ORGANISATION

THE LANCET

Annual Subscription: £2 2 0 per annum

Special reduced rates to Medical Students and Doctors within 1 year of qualification.
Air-mail edition available

MUNDESLEY SANATORIUM

MUNDESLEY, NORFOLK

TERMS FROM 16 GUINEAS WEEKLY (Single Room). Immediate vacancies
" " 14 " " (Shared Room). Waiting list: approx. 6 weeks

Medical Superintendents:

E. C. WYNNE-EDWARDS
M.B.(Cantab.), F.R.C.S.(Edin.)

GEORGE H. DAY
M.D.(Cantab.)

For all information apply THE SECRETARY

Telephone: Mundesley 94 and 95 (2 lines)

ST. ANDREW'S HOSPITAL FOR NERVOUS AND MENTAL DISORDERS
NORTHAMPTON

PRESIDENT: THE EARL SPENCER

MEDICAL SUPERINTENDENT: THOMAS TENNENT, M.D., F.R.C.P., D.P.H., D.P.M.

This Registered Hospital is situated in 130 acres of park and pleasure grounds. Voluntary patients, who are suffering from incipient mental disorders or who wish to prevent recurrent attacks of mental trouble; temporary patients, and certified patients of both sexes are received for treatment. Careful clinical, biochemical, bacteriological, and pathological examinations. Private rooms with special nurses, male or female, in the Hospital or in one of the numerous villas in the grounds of the various branches can be provided.

WANTAGE HOUSE

This is a Reception Hospital in detached grounds with a separate entrance, to which patients can be admitted. It is equipped with all the apparatus for the complete investigation and treatment of Mental and Nervous Disorders by the most modern methods; insulin treatment is available for suitable cases. It contains special departments for hydrotherapy by various methods, including Turkish and Russian baths, the prolonged immersion bath, Vichy Douche, Scotch Douche, Electrical baths, Plombières treatment, etc. There is an Operating Theatre, a Dental Surgery, an X-ray Room, an Ultraviolet Apparatus, and a Department for Diathermy and High-frequency treatment. It also contains Laboratories for biochemical, bacteriological, and pathological research. Psychotherapeutic treatment is employed when indicated.

MOULTON PARK

Two miles from the Main Hospital there are several branch establishments and villas situated in a park and farm of 650 acres. Milk, meat, fruit, and vegetables are supplied to the Hospital from the farm, gardens, and orchards of Moulton Park. Occupational therapy is a feature of this branch, and patients are given every facility for occupying themselves in farming, gardening, and fruit growing.

BRYN-Y-NEUADD HALL

The seaside house of St. Andrew's Hospital is beautifully situated in a park of 330 acres, at Llanfairfechan, amidst the finest scenery in North Wales. On the North-West side of the Estate a mile of sea coast forms the boundary. Patients may visit this branch for a short seaside change or for longer periods. The Hospital has its own private bathing house on the seashore. There is trout-fishing in the park.

At all the branches of the Hospital there are cricket grounds, football and hockey grounds, lawn tennis courts (grass and hard courts), croquet grounds, golf courses, and bowling greens. Ladies and gentlemen have their own gardens, and facilities are provided for handicrafts, such as carpentry, etc.

For terms and further particulars apply to the Medical Superintendent (TELEPHONE: Northampton 4354 (3 lines)), who can be seen in London by appointment.

CLIFFDEN, TEIGNMOUTH

For the early treatment of nervous disorders and patients needing rest and care

A well-appointed House with spacious balconies and extensive views of the South Devon Coast. Beautiful garden and own dairy in 35 acres in the same grounds. ROWDENS, a comfortable house with lovely views. Private road to the beach. There is also a charming house, EBWORTHY, MANATON, DARTMOOR, situated in 25 acres, 1100 ft. up for bracing moorland air

Resident Physicians—BERTHA M. MULES, M.D., B.S. ANNE S. MULES, M.R.C.S., L.R.C.P. *Telephones*—TEIGNMOUTH 289 and 537

BOWDEN HOUSE
HARROW-ON-THE-HILL, MIDDLESEX

Established in 1911 Tel.: BYRon 1011 & 4772
(Incorporated Association not carried on for profit)

A private clinic for the treatment of the neuroses and nervous disorders by psychotherapy and all modern physical therapies.

Apply: MEDICAL DIRECTOR

SPRINGFIELD HOUSE

Phone: BEDFORD 3417 Near BEDFORD

For MENTAL CASES (including the aged)

Fees from Eight Guineas per week

For forms of admission, &c., apply to the Resident Physician, CEDRIC W. BOWER.

INTERVIEWS IN LONDON BY APPOINTMENT.

CHISWICK HOUSE
PINNER, MIDDLESEX

Telephone: PINNER 234

A Private Home for the Treatment and Care of Mental and Nervous Illnesses in both Sexes.

A modern house, 12 miles from Marble Arch, in attractive secluded grounds. Patients treated under Certificate, Temporary or Voluntary status. Modern forms of treatment, including psychotherapy, narco-analysis, modified insulin, occupational therapy, E.C.T., etc.

DOUGLAS MACAULAY, M.D., D.P.M.

HEIGHAM HALL, NORWICH

PRIVATE MENTAL HOME for Nervous and Mental illness. All types of treatment carried out. Accommodation for Alcoholics and Addicts available. Special Geriatric Unit now open. Fees from 6 gns. per week upwards according to requirements.

Apply to Dr. J. A. SMALL Telephone: Norwich 20080

THE MEDICAL PROTECTION SOCIETY LIMITED

Over 60 years experience in medical defence and protection

Complete indemnity granted to members in cases undertaken on their behalf

ANNUAL SUBSCRIPTION: £1 for first three years for newly qualified entrants and £2 thereafter

Full Particulars from the Secretary (Dr. Alistair French) Victory House, Leicester Sq., W.C.2. Gerrard 4553 and 4814

Vacancies

ACADEMIC AND EDUCATIONAL SECTION — Page 40

ANÆSTHETICS

North East Met. R.H.B. Regs. .. 43
Royal Free, W.C.1. Sr. Reg. .. 43
St. Mary Abbots, W.8. Reg. .. 44
Birmingham R.H.B. Reg. 44
Birmingham. Selly Oak. Sr. H.O. .. 44
Dudley, Stourbridge & Dist. Sr. H.O. 45
East Anglian R.H.B. Reg. 46
Farnborough, Kent. Sr. H.O. .. 46
Ipswich. East Suffolk & Ipswich. Reg. 46
Manchester R.H.B. Cons. 42
Newcastle R.H.B. Reg. & Locum Reg. 47
Sheffield R.H.B. Sr. H.M.O. .. 42
Slough. Upton. Locum Reg. .. 49
South East Met. R.H.B. Reg. .. 49
Southend-on-Sea Gen. Sr. H.O. .. 49
Stafford H.M.C. Sr. H.O. 49
Worcester. Ronkswood. Sr. H.O. .. 50
New Zealand. Cook Hosp. Board, Gisborne. Anæsthetist 42

BACTERIOLOGY

St. Mary's, W.2. P.-t. Sr. Reg. .. 43

CASUALTY

Battersea Gen., S.W.11. H.O. or Sr. H.O. 42
Mile End, E.1. Sr. H.O. 43
Royal Free, W.C.1. Sr. H.O. 43
Westminster, S.W.1. Reg. 44
Bury St. Edmunds. West Suffolk Gen. Sr. H.O. 45
Cheltenham Gen. & Eye. Sr. H.O. .. 45
Chesterfield Royal. H.O. 45
Leeds. Public Dispensary & Hosp. Sr. H.O. 47
Liverpool United Hosps. H.O. .. 47
Maidenhead. H.O. 47
Maidstone. West Kent Gen. Sr. H.O. 47
Portsmouth Group H.M.C. Sr. H.O. .. 48
Slough. Upton. H.O. & Locum H.O. 49
Slough. Upton. Locum Sr. H.O. .. 49
Warrington Infy. Jr. H.M.O. or H.O. or Sr. H.O. 50
York City. Jr. H.M.O. 50

CHEST AND TUBERCULOSIS

London Chest, E.2. H.O.'s 43
North East Met. R.H.B. Sr. H.M.O. 41
Ashford, Middx. Sr. H.O. 44
Bishop's Stortford. Haymeads. Sr. H.O. 45
Bristol. Ham Green. H.O. 45
Colchester. British Legion San. Sr. H.O. 45
Heswall, Cheshire. Cleaver. Jr. H.M.O. 46
Leeds R.H.B. Reg. 47
Leicester Isolation Hosp. & Chest Unit. Reg. 47
Manchester R.H.B. Sr. H.M.O. .. 42
North East Met. R.H.B. Regs. .. 43
Portsmouth Group H.M.C. Reg. .. 48
South East Met. R.H.B. Regs. .. 49
South West Met. R.H.B. Sr. H.M.O. 42
Ventnor, I.W. Royal National Hosp. for Diseases of the Chest. Sr. H.O. or H.O. 50
Warwick. King Edward VII Mem. Chest. Sr. H.O. 50

DENTAL SURGERY

Hosp. for Sick Child. W.C.1. Reg. .. 44

DERMATOLOGY

University College Hosp., W.C.1. Reg. 44
Willesden Gen., N.W.10. P.-t. Clin. Asst. (G.P.) 44
Isleworth. West Middlesex. Sr. H.O. 46

EAR, NOSE, AND THROAT

North East Met. R.H.B. P.-t. Cons. 41
Birmingham & Midland Ear & Throat. Sr. H.O. or H.O. 44
Brighton & Lewes H.M.C. H.O. .. 45
Reading. Royal Berks. H.O. 48

GERIATRICS

Bradford A & B H.M.C.'s. H.O. .. 44
Glasgow. Stobhill Gen. Jr. H.M.O. .. 46
Scotland. North-Eastern R.H.B. Cons. 42

INFECTIOUS DISEASES

Royal Free, W.C.1. Sr. Reg. 43
Portsmouth Group H.M.C. Sr. H.O. 48
South Western R.H.B. Sr. H.M.O. .. 42

MEDICINE

Dreadnought Seamen's, S.E.10. Pre-reg. H.O. 42
London, E.1. Reg. 42
North East Met. R.H.B. Regs. .. 43
South London Hosp. for Women & Child., S.W.4. H.O. 43
St. James', S.W.12. Reg. 43
St. Mark's, E.C.1. P.-t. Clin. Asst. (Hon.) 44
Westminster, S.W.1. Jr. H.M.O. .. 44
Whipps Cross, E 11. Pre-reg. H.O. .. 44
Ashford, Middx. H.O. 44
Bideford & Dist. H.O. 44
Bishop's Stortford. Haymeads. H.O 45
Blackpool. Victoria. H.O. 44
Braintree. Black Notley. H.O. .. 45
Cambridge. Addenbrooke's. Reg. .. 45
Chatham. All Saints'. Sr. H.O. .. 45
Enfield. War Mem. Sr. H.O. .. 46
Epping Group H.M.C. H.O.'s .. 46
Harefield, Middx. Reg. 46
Hitchin. Lister. H.O. 46
Newton Abbot, S. Devon. Sr. H.O. .. 48
Oxford R.H.B. Reg. 48
Redhill County. Locum H.O. .. 48
Rhyl. Royal Alexandra. H.O. .. 48
Scotland. Eastern R.H.B. Temp. Sr. Reg. or Reg. 48
Scotland. South-Eastern R.H.B. Reg. or Sr. Reg. 48
Scunthorpe & Dist. War Mem. Sr. H.O. or Pre-reg. H.O. 49
Stoke-on-Trent. North Staffs Royal Infy. Pre-reg. H.O. 49
Windsor. King Edward VII. P.-t. Hon. Clin. Asst. (G.P.) 50

NEUROLOGY

National Hosps. for Nervous Diseases, W. P.-t. Cons. 41
Royal National T.N.&E., W. P.-t. Cons. 41

NEUROSURGERY

West End Hosp. for Neurology & Neurosurgery, W.1. Sr. H.O. .. 44

OBSTETRICS AND GYNÆCOLOGY

Plaistow Maternity, E.13. H.O. .. 43
Queen Charlotte's & Chelsea Hosps. P.-t. Sr. Reg. 43
Wanstead, E.11. H.O. 44
Birmingham United Hosps. H.O. .. 44
Bradford. St. Luke's. H.O. 45
Cardiff H.M.C. Sr. H.O. 45
Croydon Group H.M.C. Reg. 45
Hull Maternity. H.O.'s 46
Ilford Maternity. Sr. H.O. 46
Leeds R.H.B. Reg. 47
Manchester R.H.B. Reg. 47
Nottingham City. Sr. H.O. or H.O. 48
Plymouth. South Devon & East Cornwall Gen. Hosp. Group. H.O. 48
Portsmouth Group H.M.C. Pre reg. H.O. 48
Salisbury Gen. Reg. 49
St. Helens & Dist. H.M.C. Sr. H.O. .. 50
Taplow. Canadian Red Cross Mem. H.O. 50
Watford Maternity. H.O. 50
Yorkshire. East Riding H.M.C. Sr. H.O. or H.O. 50

OPHTHALMOLOGY

Royal Eye, S.E.1. Sr. H.O. 43
Brighton. Sussex Eye. Sr. H.O. & H.O. 45
Manchester United Hosps. Sr. H.O. 47
Sheffield R.H.B. Sr. H.M.O. 42

ORTHOPÆDICS

Whipps Cross, E.11. Pre-reg. H.O. .. 44
Birmingham R.H.B. Reg. 44
Cardiff United Hosps & Welsh R.H.B. P.-t. Cons. 41
Derby. Derbyshire Royal Infy. Reg. 45
Ipswich. East Suffolk & Ipswich. H.O. 46
Kingston, Surrey. Locum Sr. H.M.O. 42
Kingston, Surrey. Sr. H.O. & Locum Sr. H.O. 47
Leeds R.H.B. Regs. 47
Liverpool United Hosps. H.O. .. 47
Manchester R.H.B. Reg. 47
Nottingham Gen. Sr. H.O. 48
Reading. Battle. H.O. 48
Romford. Oldchurch. H.O. 48
Scotland. Eastern R.H.B. Reg. .. 48
Sheffield United Hosps. Reg. 49
Swansea. Sr. H.O. 49

PÆDIATRICS

Bury & Rossendale H.M.C. Sr. H.O. 45
Glasgow. Royal Hosp. for Sick Child. Sr. H.O.'s 46
Hull. Victoria Hosp. for Sick Child. Locum Sr. H.O. 46
Manchester. West Manchester H.M.C. H.O. 47
Portsmouth Group H.M.C. H.O. .. 48
Reading. Royal Berks. H.O. 48
Southampton Child's. H.O. 49
Wrexham. Maelor Gen. Pre-reg. H.O. 50
British Columbia. Child's Hosp., Vancouver. Residents. 51

PATHOLOGY

North East Met. R.H.B. Regs. .. 43
North West Met. R.H.B. Sr. H.M.O. 41
Royal Free, W.C.1. H.O. 43
Manchester R.H.B. Reg. 47
Portsmouth & Isle of Wight Area Path. Service. Reg. 48
Romford. Oldchurch. Sr. H.O. .. 48
Taplow. Canadian Red Cross Mem. Sr. H.O. 50
Ibadan, Nigeria. Univ. College Hosp. Sr. Reg. & Reg. 50

PHYSICAL MEDICINE

Middlesex, W.1. Sr. Reg., Reg. & Sr. H.O. 43
St. James', S.W.12. Reg. 43
Scotland. North-Eastern R.H.B. Sr. H.M.O. 42

PLASTIC SURGERY

Chepstow. St. Lawrence. Sr. H.O. .. 45

PSYCHIATRY

Birmingham. Monyhull Hall. Jr. H.M.O. 44
Birmingham R.H.B. Reg. 44
East Anglian R.H.B. Sr. H.M.O. .. 41
Epsom. West Park. Regs. 46
Leeds R.H.B. Regs. 47
Newcastle R.H.B. Reg. 47
Retford, Notts. Rampton. Cons. .. 42
Sheffield R.H.B. Sr. H.M.O. 42
South East Met. R.H.B. Sr. Reg. & Reg. 49
South West Met. R.H.B. Sr. H.M.O. 42
St. Albans. Shenley. Sr. H.O. .. 49
Welsh R.H.B. Reg. 50
Welsh R.H.B. Sr. H.M.O. 42

RADIOLOGY

East Anglian R.H.B. Sr. H.M.O. .. 41
Manchester R.H.B. Reg. 47
Sheffield United Hosps. Sr. Reg. .. 49
Canada. Regina Gen., Sask. Director 42

RHEUMATOLOGY

Taplow. Canadian Red Cross Mem. Sr. H.O. & H.O. 50

SURGERY

German, E.8. H.O. 42
Hosp. for Sick Child. W.C.1. Sr. Reg. & P.-t. Sr. Reg. 44
North East Met. R.H.B. Reg. .. 43
Poplar, E.14. Pre-reg. H.O. .. 43
Prince of Wales's Gen., N.15. Sr. H.O. 43
Queen Mary's Hosp. for the East End, E.15. H.O. 43
South London Hosp. for Women & Child., S.W.4. H.O. 43
South Western, S.W.9. Sr. H.O. .. 43
St. George-in-the-East, E.1. H.O. .. 43
St. James', S.W.12. Reg. 43
St. Mary Abbots, W.8. Reg. 44
St. Mary's, W.2. P.-t. Sr. H.O. .. 44
St. Mary's, W.2. Reg. 43
Westminster, S.W.1. Sr. Reg. .. 44
Birmingham Accident. H.O. .. 44
Birmingham R.H.B. Reg. 44
Bradford Royal Infy. H.O. 45
Bury & Rossendale H.M.C. Pre-reg. H.O. 45
Caerphilly Dist. Miners. Pre-reg. H.O. 45
Cardiff United Hosps. Sr. H.O. .. 45
Carshalton. St. Helier. Pre-reg. H.O. 45
Cheltenham Gen. & Eye. H.O. .. 45
Chesterfield Royal. H.O.'s 45
Derby City. Reg. 45
Doncaster Royal Infy. H.O. 46
Dorchester. Dorset County. H.O. .. 45
Dudley, Stourbridge & Dist. Sr. H.O. & Pre-reg. H.O. 45
East Anglian R.H.B. Regs. 46
Exeter. Royal Devon & Exeter. H.O. 46
Gt. Yarmouth & Gorleston Gen. H.O. 46
Haddington, East Lothian. Roodlands Gen. H.O. 46
Hastings. Royal East Sussex. Pre-reg. H.O. 46
Hastings. St. Helen's. Pre-reg. H.O. 46
Hull. Victoria Hosp. for Sick Child. H.O. 46
Kingston, Surrey. Sr. H.O. 47
Liverpool. Bootle. H.O. 47
Lowestoft & North Suffolk. Sr. H.O. 47
Manchester. West Manchester H.M.C. Pre-reg. H.O. 47
Newcastle R.H.B. Reg. 47
Nottingham. Highbury. Sr. H.O. .. 48
Ormskirk County. H.O. 48
Pontypridd. East Glamorgan. H.O. 48
Portsmouth Group H.M.C. Sr. H.O. 48
Salisbury Gen. Locum H.O. 49
Sheffield City Gen. H.O. 49
South West Met. R.H.B. P.-t. Cons. 42
Swansea. Sr. H.O. 49
Warrington Infy. H.O. 50
Welsh R.H.B. Reg. 50
West Bromwich & Dist. Gen. Pre-reg. H.O. 50
Weymouth & Dist. H.O. 50
Windsor. King Edward VII. P.-t. Hon. Clin. Asst. (G.P.) 50
Wolverhampton Group. Pre-reg. H.O. 50
Wrexham. Maelor Gen. Pre-reg. H.O. 50
Wrexham War Mem. Pre-reg. H.O. .. 50

THORACIC SURGERY

Bradford Royal Infy. Sr. H.O. .. 45
Ilkley. Middleton. Sr. H.O. 46
Leeds R.H.B. Reg. 47
Nottingham City. Reg. 47

UROLOGY

Newcastle Gen. Sr. H.O. 47

GENERAL

U.S.A. Richmond, Virginia. Hosp. Div. Med. College of Virginia. Asst. Residents 51

PUBLIC APPOINTMENTS 51

GENERAL PRACTICE 52

NON-MEDICAL 52

MISCELLANEOUS 52

The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies, but candidates may normally visit the hospital by appointment.

Academic and Educational

EXAMINING BOARD IN ENGLAND
by the
ROYAL COLLEGE OF PHYSICIANS OF LONDON
and the
ROYAL COLLEGE OF SURGEONS OF ENGLAND

Notice is hereby given that the following Examinations will commence on the dates stated below :—

DIPLOMA IN CHILD HEALTH
16th March
DIPLOMA IN MEDICAL RADIOTHERAPY
21st April
DIPLOMA IN MEDICAL RADIO-DIAGNOSIS
Part II—21st April
DIPLOMA IN ANÆSTHETICS
DIPLOMA IN PATHOLOGY
5th May

Applications and fees for either or both Parts of an Examination must reach the Secretary, Examination Hall, Queen-square, London, W.C.1, at least 21 days before Part I of the Examination begins. FRANCIS M. STENT, Secretary.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

SURGERY LECTURES AND CLINICAL CONFERENCES
MARCH–APRIL 1955

A Course of 24 Surgery Lectures, with 10 Clinical Conferences at certain selected hospitals, will be held from 28TH MARCH to 19TH APRIL, 1955. Only a limited number of students can be accepted for the Clinical Conferences.

Fees : Whole Course—£15 15s.
Lectures only—£10 10s.
Single Lectures—10s. each.

Applications, accompanied by a cheque for the appropriate fee, should be sent to Mr. W. F. DAVIS, Deputy Secretary, Royal College of Surgeons of England, Lincoln's Inn-fields, W.C.2, from whom further information may be obtained (Tel. HOLborn 3474).

FACULTY OF ANÆSTHETISTS
of the
ROYAL COLLEGE OF SURGEONS OF ENGLAND

ANÆSTHETICS

A Full-time Course of Lectures, Clinical Conferences and Discussion Groups in Anæsthetics will be held at the College from 14TH MARCH to 1ST APRIL, 1955. Fees : Lectures £15 15s. or 10s. per lecture, Clinical conferences £5 5s. and Discussion groups £15 15s.

PHARMACOLOGY

A Course of 20 Lectures in Pharmacology will be held each evening at the College from 9TH to 20TH MAY, 1955. Fee : £6 6s. for the full Course, or 10s. per lecture.

Details and application forms for both Courses may be obtained from Mr. W. F. DAVIS, Secretary, Faculty of Anæsthetists, Royal College of Surgeons of England, Lincoln's Inn-fields, London, W.C.2 (Telephone : HOLborn 3474).

UNIVERSITY OF GLASGOW

CIBA FELLOWSHIP IN CLINICAL PHARMACOLOGY

Applications are invited for a Fellowship to be known as the Ciba Fellowship in Clinical Pharmacology, which has been established in the University by Ciba Laboratories Ltd. The Fellowship is of the value of between £1200 and £1500 p.a., according to the experience of the successful applicant. It is tenable for 2 years. The purpose of the work to be undertaken by the Fellow is defined as " to develop techniques for the clinical evaluation of drugs where suitable techniques are not already available." The Fellow will work under the direction of the Professor of Materia Medica in the clinical division of the Department at Stobhill General Hospital, Glasgow. Facilities are available in the departmental laboratories at the University for collaboration with experimental pharmacologists. The appointment is whole-time.

Applications (3 copies), with a statement of experience and the names of 3 referees, should be sent to the undersigned not later than 12th March, 1955.

ROBT. T. HUTCHESON, Secretary of University Court.

INSTITUTE OF NEUROLOGY
(Queen-square)

A SPECIAL COURSE OF LECTURES dealing with " The Neurological Aspects of Ear, Nose and Throat Diseases " will be given at The National Hospital, Queen-square, on MONDAYS at 5.30 P.M. from 14TH MARCH to 6TH JUNE inclusive.

The fee for attending the course will be 2 guineas.

Details of lecture titles will be advertised later.

INSTITUTE OF BASIC MEDICAL SCIENCES
ROYAL COLLEGE OF SURGEONS OF ENGLAND
BRITISH POSTGRADUATE MEDICAL FEDERATION
(UNIVERSITY OF LONDON)

LECTURES AND DEMONSTRATIONS IN ANATOMY, PHYSIOLOGY AND PATHOLOGY
SEPTEMBER–DECEMBER, 1955

A full-time Course of Lectures and Demonstrations in the above subjects will be held at the Institute from 19TH SEPTEMBER to 17TH DECEMBER, 1955. Applications for this Course will be strictly limited. Fee £63.

Closing date for applications is Friday, 8th April, 1955.

L.M.S.S.A.

FINAL EXAMINATION : SURGERY, 14th March, 12th April, 9th May, 1955. MEDICINE, PATHOLOGY, 21st March, 18th April, 16th May, 1955. MIDWIFERY, 22nd March, 19th April, 17th May, 1955. MASTERY OF MIDWIFERY, May and November. DIPLOMA IN INDUSTRIAL HEALTH, July and December.

For regulations apply REGISTRAR, Apothecaries' Hall, Black Friars-lane, London, E.C.4.

UNIVERSITY OF EDINBURGH

WILLIAM RAMSAY HENDERSON TRUST

A LECTURE will be delivered in the Anatomy Lecture Theatre, University New Buildings, Teviot-place, Edinburgh, on TUESDAY, 22ND FEBRUARY, at 5 P.M., by JOHN BRANDER, Esq., M.D., F.R.C.P., formerly Medical Superintendent, Friern Hospital, New Southgate, London.

Subject : " A Morphological Survey of the Hypophysis Cerebri (Pituitary Body)."

Chairman : Prof. Emeritus J. C. Brash, M.C., M.D. Wallace & Guthrie, W.S. (Agents).

CHARLES H. STEWART, Secretary to the University.

COURSE IN ADVANCED ORTHOPÆDICS
at the
INSTITUTE OF ORTHOPÆDICS
28TH MARCH–1ST APRIL, 1955

Monday, 28th March, Town Section, 234, Great Portland-street, W.1. (Lecture Room)
10.40 A.M.–12.40 P.M. Scoliosis .. .. .. Mr. J. I. P. JAMES
2.00 P.M.–3.00 P.M. Bacteriological Aspects of Joint Tuberculosis .. Dr. C. H. LACK
3.00 P.M.–4.00 P.M. Volkmann's Contracture .. Mr. H. J. SEDDON
Tuesday, 29th March, Town Section
10.15 A.M.–11.15 A.M. Metabolic Disorders of Bone .. Dr. R. NASSIM
11.30 A.M.–12.40 P.M. Pain Down the Arm .. Dr. P. F. SANDIFER
2.00 P.M.–4.00 P.M. Medical Aspects of Joint Tuberculosis .. Dr. F. H. STEVENSON
Wednesday, 30th March, Town Section
9.45 A.M.–10.45 A.M. Bone Repair .. .. .. Dr. H. A. SISSONS
11.00 A.M.–12.40 P.M. Peripheral Vascular Disorders .. Mr. G. L. W. BONNEY
2.00 P.M.–3.00 P.M. Biochemistry in Orthopædics .. Dr. P. G. WALKER
3.00 P.M.–4.00 P.M. Slipped Femoral Epiphyses .. Mr. H. J. BURROWS
Thursday, 31st March, Country Section, Brockley Hill, Stanmore, Middlesex (Hut 5)
10.30 A.M.–12.40 P.M. General Clinical Demonstration .. Mr. D. TREVOR
1.45 P.M.–2.45 P.M. Spondylolisthesis .. .. Mr. P. H. NEWMAN
2.45 P.M.–4.30 P.M. The Early Treatment of Paralysis in Poliomyelitis .. Mr. D. M. BROOKS
Friday, 1st April, Country Section
10.30 A.M.–12.40 P.M. General Clinical Demonstration .. Mr. K. I. NISSEN
2.00 P.M.–3.00 P.M. Plaster of Paris Technique .. Mr. E. L. TRICKEY

The fee for the course (including lunch and tea) is 7 guineas.

Early application should be made to the Dean at the Town Section.

COURSE IN THERAPEUTICS
at the
INSTITUTE OF ORTHOPÆDICS
28TH FEBRUARY–5TH MARCH, 1955

Monday, 28th February, Town Section, 234, Great Portland-street, W.1. (Lecture Room)
10.00 A.M.–11.00 A.M. Rest and Movement .. .. Mr. H. J. BURROWS
11.15 A.M.–12.35 P.M. Electrotherapy .. .. Mr. H. J. SEDDON
1.45 P.M.–3.00 P.M. Chemotherapy in Joint Tuberculosis .. Dr. F. H. STEVENSON
3.00 P.M.–4.00 P.M. Manipulation .. .. Mr. K. I. NISSEN
Tuesday, 1st March, Town Section
10.00 A.M.–11.00 A.M. Osteomyelitis .. .. Mr. D. TREVOR
11.15 A.M.–12.40 P.M. Treatment of Rheumatic Joint Disorders .. Dr. P. D. SAVILLE
2.00 P.M.–3.00 P.M. The Surgery of Spastic Paralysis .. Mr. K. I. NISSEN
Wednesday, 2nd March, Town Section
10.00 A.M.–11.00 A.M. Traction Injuries of Nerves .. Mr. D. M. BROOKS
11.15 A.M.–12.40 P.M. Bone Grafting and Plating .. Mr. D. TREVOR
1.45 P.M.–3.15 P.M. Arthrodesis and Arthroplasty .. Mr. H. J. BURROWS
3.15 P.M.–4.15 P.M. Tendon Injuries .. .. Mr. J. I. P. JAMES
Thursday, 3rd March, Country Section, Brockley Hill, Stanmore, Middlesex (Hut 5)
9.45 A.M.–12.30 P.M. Orthopædic Appliances and Preservation of Movement in Joint Tuberculosis .. Mr. J. A. CHOLMELEY
2.00 P.M.–3.30 P.M. Treatment of Low Back Pain .. Mr. P. H. NEWMAN
Friday, 4th March, Country Section
10.00 A.M.–11.00 A.M. Clinical Demonstration .. Mr. A. T. FRIPP
11.30 A.M.–12.30 P.M. Clinical Demonstration .. Mr. J. I. P. JAMES
2.30 P.M.–4.00 P.M. Treatment of Pott's Diseases .. Mr. H. J. SEDDON
Saturday, 5th March, Country Section
10.00 A.M.–NOON Plastic Surgery in Orthopædics .. Mr. R. L. G. DAWSON

The fee for the course (including lunch and tea) is 7 guineas.

Early application should be made to the Dean at the Town Section.

ROFFEY PARK INSTITUTE
(DEPARTMENT OF OCCUPATIONAL HEALTH AND SOCIAL MEDICINE)

POSTGRADUATE COURSE ON RESETTLEMENT AFTER ILLNESS

The next residential course starts on MONDAY, 7TH MARCH, 1955, and lasts 5 days. The course is intended for Medical and Surgical Consultants and Senior Registrars, for whom Regional Boards normally pay the comprehensive cost of £10 10s. Some vacancies are available for general practitioners under National Health Service regulations. Accommodation is provided in a comfortable residential club. Course limited to 25.

Apply Medical Director, Roffey Park Institute, Horsham, Sussex.

THE MIDDLESEX HOSPITAL MEDICAL SCHOOL, W.1

PRIZE IN APPLIED PHARMACOLOGY

An annual Prize, value 25 guineas, has been instituted, and the Examination will consist of a 3-hour Paper and a Viva.

Candidates must be ex-students of the School who have obtained their first registrable medical qualification at least 3 months and not more than 15 months before 30th April, 1955.

The Paper will be written at The Middlesex Hospital Medical School on 18TH MAY, 1955.

Candidates are required to submit their names in writing to the Dean not later than Saturday, 30th April, 1955.

CLARE COLLEGE

HARRISON WATSON STUDENTSHIP FOR MEDICAL RESEARCH

The Governing Body of Clare College, Cambridge, invite applications for a Harrison Watson Studentship commencing on 1ST OCTOBER, 1955. The Studentship, which is open to male graduates of any University in any country, is for research or training in research "into the causes and cure of tuberculosis, and/or other diseases of an allied character." The Governing Body intend to interpret these terms in the widest possible sense and they invite detailed inquiries.

The Studentship may be :—

(i) a Junior Studentship of value between £500 and £650 a year, normally tenable for 3 years, or
(ii) a Senior Studentship of value between £800 and £1000 a year, tenable for 1, 2, or 3 years.

The Student may also hold another award or post, and may engage in a limited amount of teaching, if in the opinion of the Governing Body these do not interfere with his research. The Student will be required to become a member of Clare College and the University of Cambridge, and to reside and work in Cambridge.

Applications should contain an account of the applicant's career, and a general statement of his proposed course of research. No testimonials need be submitted, but the names and addresses of not fewer than 2 referees should be sent. Applications and inquiries should be addressed to the Master, Clare College, Cambridge. The closing date for application is 16th April, 1955.

ROYAL FREE HOSPITAL SCHOOL OF MEDICINE, Hunter-street, London, W.C.1. Applications are invited from registered medical practitioners (Men or Women) for the appointment from 1st April, 1955, or as soon after as possible, of LECTURER IN MORBID ANATOMY AND HISTOLOGY AND HONORARY ASSISTANT PATHOLOGIST to the Royal Free Hospital Teaching Group. Duties include teaching and hospital diagnostic routine. Previous experience in all branches of pathology essential; some experience in above speciality desirable. Salary within the current University scale with superannuation benefits and family allowances.

Applications (8 copies), stating age, qualifications and experience, with 8 copies of 3 testimonials, to be sent, not later than 28th February, 1955, to the Secretary at the above address, from whom further particulars may be obtained.

THE WELSH NATIONAL SCHOOL OF MEDICINE. (UNIVERSITY OF WALES.) Applications are invited for the appointment of ASSISTANT LECTURER (full-time) in the Department of Obstetrics and Gynæcology, for a period of 1 year in the first instance. Salary in the range £650–£100–£950 p.a., subject to revision now under consideration. Family allowance and superannuation. If the person appointed also becomes holder of a research scholarship now vacant, the salary will be adjusted accordingly.

Further particulars of the appointment may be obtained from the undersigned by whom applications must be received not later than Saturday, 26th February, 1955.

34, Newport-road, Cardiff. F. DODSWORTH, Secretary.

UNIVERSITY OF CAPE TOWN/PROVINCIAL ADMINISTRATION OF THE CAPE OF GOOD HOPE JOINT MEDICAL STAFF. Applications are invited for the CHAIR OF SURGERY in the University of Cape Town. The appointment will be made under the terms of the Joint Staff Agreement between the University of Cape Town and the Provincial Administration of the Cape of Good Hope. It is a full-time appointment and the occupant of the Chair is not permitted to undertake remunerative private work. The salary is £2500 p.a., plus a temporary cost-of-living allowance (at present £320 p.a. for a married man and £100 p.a. for others). The professor is Head of the Division of Surgery. He will be in charge of surgical beds in Groote Schuur Hospital.

Applications (with copies of testimonials), should state age, experience, qualifications and research work completed or in progress, and give the names of 2 referees whom the University may consult. 2 copies of the application and testimonials should reach the Secretary, Association of Universities of the British Commonwealth, 5, Gordon-square, London, W.C.1 (from whom a memorandum giving the general conditions of appointment should be obtained) not later than 30th April, 1955. An additional copy should be sent direct by air-mail to the Registrar, University of Cape Town, Private Bag, Rondebosch, Cape Town, South Africa, by the same date.

The University reserves the right to recommend the appointment of a person other than one of the applicants or to recommend no appointment.

UNIVERSITY OF LONDON. Applications are invited for HAZEL CLIFFORD POSTGRADUATE STUDENTSHIP, for research in Medicine or on a scientific topic concerned with advancement of medical knowledge. The Studentship, which is of the value of not less than £550 a year, will be awarded for 1 year in the first instance, and is open to Graduates of the University of London who are either registered medical practitioners or in possession of qualifications which, in the opinion of the Senate, would enable them to undertake the research indicated.

Forms and further particulars from Secretary to the Scholarships Committee, Senate House, London, W.C.1, to whom completed applications must be returned by 1st March, 1955.

UNIVERSITY OF QUEENSLAND, Australia. Applications are invited for the position of CHIEF LECTURER IN PHYSIOLOGY. Salary range £A1800–£A2050 p.a. Applicants should be graduates in medicine, and should have had postgraduate experience in some branch of physiology (human, general or comparative), pharmacology or biochemistry. Facilities exist for research particularly in neurophysiology, endocrinology, and water and electrolyte adaptions.

Further particulars are obtainable from the Secretary, Association of Universities of the British Commonwealth, 5, Gordon-square, London, W.C.1. Applications close with the undersigned on 15th March, 1955.

C. PAGE HANIFY, Registrar.

Hospital Services : Senior Appointments

NATIONAL HOSPITALS FOR NERVOUS DISEASES. The Board of Governors invites applications for the appointment of ASSISTANT PHYSICIAN (Consultant status) at The National Hospital, Queen-square, W.C.1. Candidates should be Members or Fellows of the Royal College of Physicians. The appointment will be part-time and the successful applicant will be required to attend 4 half-days per week.

Applications (36 copies), giving the names of 3 referees, must be submitted to the undersigned not later than 5th March, 1955.

H. EWART MITCHELL, Secretary.

The National Hospitals for Nervous Diseases,
Queen-square, W.C.1.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

Full-time ASSISTANT CHEST PHYSICIAN (Senior Hospital Medical Officer grade) at East Ham Chest Clinic. The Clinic is closely associated with Plaistow Hospital Chest Unit of 49 Beds. The successful candidate will work under the general supervision of the visiting Consultant Physician and should preferably hold a higher qualification and have a good background of general medicine with special experience in diseases of the chest including tuberculosis. The post offers exceptional opportunities for further experience in diseases of the chest and for research.

Part-time CONSULTANT E.N.T. SURGEON (2 sessions a week), Queen Mary's Hospital for the East End, E.15.

Applications (6 copies) and names of 3 referees should reach the Secretary, 11A, Portland-place, London, W.1, by Saturday, 26th February, 1955.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

Whole-time ASSISTANT PATHOLOGIST, Central Histological Laboratory, Whittington Hospital, Archway Wing, N.19. Good experience in morbid anatomy essential and experience in neuropathology an advantage. Salary £1500 (unless below age 32)–£1950. Laboratory may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 14th March, 1955.

ROYAL NATIONAL THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.1, and Golden-square, W.1. (Designated as a teaching hospital.) The Board of Governors invites applications for a post of NEUROLOGIST, which is a Consultative one entailing occasional visits from time to time as the need arises, but there are no regular sessions. It is estimated that the time required for the duties averages 1 hour per week, but this is subject to revision in the light of experience.

Applications (10 copies) should give details of age, qualifications, experience and posts held, together with the names of 2 referees, and should be sent to the House Governor by 25th March, 1955.

CARDIFF. UNITED CARDIFF HOSPITALS AND WELSH REGIONAL HOSPITAL BOARD. Part-time CONSULTANT ORTHOPÆDIC AND TRAUMATIC SURGEON to work in hospitals of Board of Governors and Regional Hospitals near Cardiff.

Applications (12 copies), with names of 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

EAST ANGLIAN REGIONAL HOSPITAL BOARD.

(1) ASSISTANT PSYCHIATRIST, Little Plumstead (near Norwich) Mental Deficiency Group of hospitals and Child Psychiatry Service. The Group (900 Beds) which is progressive and the centre for much outpatient work including child guidance clinics, is recognised as a training centre for the D.P.M. by the Conjoint Board and the R.M.P.A. The building of a number of new villas is well advanced. House available. Salary scale £1500–£1950. Candidates invited to visit Hospital by direct arrangement with Medical Superintendent.

(2) ASSISTANT RADIOLOGIST (whole-time) at Hospitals in the Peterborough and Stamford area. Duties mainly at Peterborough Memorial Hospital where there is a new and fully equipped X-ray Department. Wide experience and higher qualification necessary. Salary scale £1500–£1950. Candidates invited to visit hospitals concerned by direct arrangement with Hospital Management Committee Secretary, Memorial Hospital, Peterborough.

Applications (8 copies), stating age, experience and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 21st February, 1955.

KINGSTON HOSPITAL, Wolverton-avenue, Kingston-on-Thames. KINGSTON GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from suitably qualified medical officers for the Locum appointment of Whole-time ASSISTANT ORTHOPÆDIC SURGEON (Senior Hospital Medical Officer grade) from 1st March, 1955, to 15th March, 1955, inclusive.

Applications, stating age, qualifications and experience, together with 2 recent testimonials, should reach the Physician-Superintendent of the Hospital not later than 19th February, 1955.

MANCHESTER REGIONAL HOSPITAL BOARD.

(*a*) CONSULTANT ANÆSTHETIST, Royal Manchester Children's Hospital, Pendlebury, and Salford Royal Hospital, Whole-time for minimum of 3 years when Board will consider application for maximum part-time employment. Higher qualification in anæsthetics essential, successful candidate to live in or near Salford. 28th February, 1955.

(*b*) Whole-time TUBERCULOSIS PHYSICIAN (Senior Hospital Medical Officer), Preston and Chorley Hospitals (Preston and Chorley Chest Clinics, Preston Isolation Hospital, Heath Charnock Hospital and Chestnuts Sanatorium), to work under general guidance of a Consultant. Previous experience of thoracic medicine and tuberculosis essential, higher qualification desirable. The appointment may be made in conjunction with the Local Health Authorities concerned, for whom the appointee will carry out duties in connection with prevention, care and after-care. 2nd March, 1955.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by dates stated.

RETFORD (near), NOTTINGHAMSHIRE. RAMPTON HOSPITAL. (1143 Beds.) BOARD OF CONTROL. Whole-time DEPUTY MEDICAL SUPERINTENDENT (Consultant) at above Hospital for patients exhibiting conduct disorders with mental deficiency. Excellent opportunities for study, treatment and training of behaviour disorders of all kinds and degrees. Applicants must be registered medical practitioners, with experience in psychiatry and the D.P.M.; post is clinical, but experience in hospital administration an advantage; duties may involve attendance at outpatient clinics. Appointment on National Health Service conditions of service and superannuation regulations. House on the estate available at appropriate rental.

Applications, stating name, date and place of birth, nationality, details of education, professional qualifications, war service, present and previous appointments, and names of 3 referees, to Medical Superintendent, Rampton Hospital, Retford, Notts, by 5th March, 1955. Envelopes to be marked A/DMS. Canvassing in any form leads to disqualification. Candidates may visit Hospital by appointment with Medical Superintendent.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR ASSISTANT PSYCHIATRIST for Rauceby Hospital, Sleaford. A newly-built house on the Hospital estate is available. Salary scale £1500–£50–£1950.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 12th March, 1955.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT OPHTHALMOLOGIST for the Rotherham, Mexborough and Worksop areas, for both hospital and school clinical duties. Salary £1500–£50–£1950.

Application form and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Form to be returned by 12th March, 1955.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT ANÆSTHETIST for the Moorgate General Hospital, Rotherham, with duties in other hospitals in the Group. Candidates should preferably be in possession of the D.A. Salary scale £1500–£50–£1950 p.a.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 4th March, 1955.

SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of DEPUTY RESIDENT PHYSICIAN (infectious diseases) at Ham Green Hospital, near Bristol, which contains 362 Beds for infectious diseases. The appointment will be on a whole-time basis in the Senior Hospital Medical Officer grade. Applicants should possess good medical qualifications, and previous experience in infectious diseases is essential. Experience in the treatment of respiratory insufficiency, especially in cases of poliomyelitis, would be a great advantage. The successful candidate will work at Ham Green Hospital, under the general direction of the Resident Physician in the Infectious Diseases Department. A small house is available in the Hospital grounds, or single resident accommodation can be provided.

Applications (12 copies), stating date of birth, qualifications and experience, together with 12 copies of 2 testimonials, and the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 24th February, 1955.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Part-time CONSULTANT SURGEON (2 half-days per week) for the Croydon Group. Duties mainly at Croydon General Hospital (200 Beds) and Purley Hospital (53 Beds); also to serve on emergency rota for both hospitals. Consultant appointed will be required to live within easy access of the hospitals.

Applications (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 12th March, 1955. Applicants may visit hospitals by local arrangement.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer grade) at St. Lawrence's Hospital, Caterham, Surrey (2250 Beds), a hospital for treatment and training of mental defectives of both sexes, of varying grades and types and of all ages. Candidates should possess D.P.M.

Applications (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 5th March, 1955. Applicants may visit Hospital by local arrangement.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for a Whole-time ASSISTANT CHEST PHYSICIAN (Senior Hospital Medical Officer grade) for the Isle of Wight. The successful applicant will have duties at the Island's Chest Clinic and in connection with the preventive and after-care services of the Isle of Wight County Council. He will also be appointed to the staff of the Royal National Hospital for Diseases of the Chest, Ventnor, which has 250 Beds with full facilities for thoracic surgery.

Applications (5 copies), giving date of birth, qualifications, experience and names of 3 referees, to the Area Secretary, Highcroft, Romsey-road, Winchester, by 7th March, 1955. Applicants may visit the Hospital by local arrangement.

SCOTLAND. NORTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited from medical officers having training and experience in the methods of physical medicine for appointment on a full-time basis in the grade of SENIOR HOSPITAL MEDICAL OFFICER. An appropriate higher qualification or diploma is desirable. Main duties will be in hospitals and clinics in Aberdeen.

Applications, together with the names and addresses of 2 referees, should be forwarded by 12th March, 1955, to the Secretary, 1, Albyn-place, Aberdeen, from whom further particulars may be obtained.

SCOTLAND. NORTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited to fill a vacancy for a CONSULTANT PHYSICIAN with special interest in Geriatrics. The Physician appointed will be in general charge of beds for chronic sick and elderly patients and will be expected to organise a hospital geriatric service based on the Glenburn Wing, Woodend Hospital, Aberdeen. Service may be on a full-time or sessional basis as may be arranged.

Applications, together with the names and addresses of 2 referees, should be forwarded by 12th March, 1955, to the Secretary, 1, Albyn-place, Aberdeen, from whom further particulars may be obtained.

WELSH REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer) at Cefn Coed Hospital, Swansea (710 Beds). Modern treatments. Adult psychiatric outpatient clinics. Resident/non-resident.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

CANADA. REGINA GENERAL HOSPITAL, Regina, SASKATCHEWAN. Applications are invited for the position of DIRECTOR, Radiology Department, in this 800-Bed General Hospital. Work mostly diagnostic. Remuneration and conditions of service to be arranged. Minimum starting salary $10,000.

Applications and inquiries to Superintendent, Regina General Hospital, Regina, Saskatchewan.

NEW ZEALAND. COOK HOSPITAL BOARD, Gisborne, NEW ZEALAND. Applications, closing Friday, 25th March, 1955, are invited from registered medical practitioners for the appointment of Full-time or Part-time ANÆSTHETIST. Full-time appointment salary to be in accordance with the following gradings:—

Senior Registrar £1105 15s.–£1220 15s.
Junior Specialist £1352 12s.–£1652 12s.

Amounts quoted are in New Zealand currency. The position is non-resident.

Conditions of appointment will be supplied on application to the High Commissioner for New Zealand, 415, Strand, London, W.C.2, but completed applications are to be sent by air-mail direct to the Secretary, Cook Hospital Board, Gisborne, N.Z.

Hospital Services : Junior Appointments

BATTERSEA GENERAL HOSPITAL, Battersea Park, S.W.11. CASUALTY OFFICER (residence optional). House Officer or Senior House Officer grade according to experience. Vacant end of March.

Apply Hospital Secretary, enclosing copies of 2 testimonials.

DREADNOUGHT SEAMEN'S HOSPITAL, Greenwich, S.E.10. HOUSE PHYSICIAN (pre-registration) required on 1st March.

Applications, stating age, nationality, qualifications and experience with 3 recent testimonials, should be sent to the undersigned on or before 21st February.

F. A. LYON, Secretary.

Dreadnought Seamen's Hospital, Greenwich, S.E.10.

GERMAN HOSPITAL, London, E.8. (General—157 Beds.) Applications are invited from registered medical practitioners for the 6 months appointment of HOUSE SURGEON (vacant 1st March) and should be sent to the Group Secretary, Hackney Hospital, London, E.9, quoting GH/HS.

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the post of REGISTRAR in General Medicine. A higher qualification, although desirable, is not essential.

Applications (12 copies), giving the names and addresses of 3 referees, should be received by the House Governor by 28th February, 1955. H. BRIERLEY, House Governor.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. 2 vacancies occur 1st April, 1955, for RESIDENT HOUSE PHYSICIAN. Appointments for 6 months, 4 in London, 2 at the Country Branch, near Letchworth, and posts are graded as House Officer. Duties include work in the Outpatient Department and Refill Clinic as well as in wards.

Applications, stating age, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 19th February.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

MIDDLESEX HOSPITAL, W.1. Applications invited for the following posts in the Department of Physical Medicine and Rheumatism :—

SENIOR REGISTRAR.
REGISTRAR.
SENIOR HOUSE OFFICER.

Forms of application obtainable from the Deputy Superintendent should be returned, naming 2 referees, by 5th March.

MILE END HOSPITAL, Bancroft-road, E.1. (475 Beds.) CASUALTY AND RECEIVING-WARD OFFICER (Senior House Officer) required for duty on 13th March, 1955.

Application forms may be obtained from the Physician-Superintendent and should be returned by 18th February with copies of not more than 3 testimonials.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) MEDICAL REGISTRAR (resident), St. Leonard's Hospital, N.1.

(2) MEDICAL REGISTRAR (resident or non-resident), St. Clement's Hospital, E.3.

(3) ANÆSTHETIC REGISTRAR (non-resident), North Middlesex Hospital and Annexes, Edmonton, N.18. Recognised for D.A. and F.F.A.R.C.S.

(4) ANÆSTHETIC REGISTRAR (resident), St. Andrew's Hospital, E.3. Recognised for D.A. and F.F.A.R.C.S.

(5) SURGICAL REGISTRAR (resident or non-resident but sleeping in on duty nights), Mile End Hospital, E.1. Recognised for F.R.C.S.

(6) REGISTRAR in Pathology (resident), St. Ann's General Hospital, Tottenham, N.15.

(7) REGISTRAR in Pathology (non-resident), Queen Mary's Hospital for the East End, Stratford, E.15.

(8) REGISTRAR in Diseases of the Chest (resident), High Wood Hospital for Children, Brentwood, Essex. Experience in tuberculosis or diseases in childhood essential.

(9) REGISTRAR in Pulmonary Tuberculosis (resident), Black Notley Hospital, Braintree, Essex.

Appointments subject to review after 1 year.

Separate applications in duplicate, with 2 copies of 2 recent testimonials, to Secretary, 11A, Portland-place, W.1, by 26th February, 1955.

PLAISTOW MATERNITY HOSPITAL, Howards-road, Plaistow, London, E.13. RESIDENT OBSTETRIC OFFICER (House Officer, second or third post) required for 6 months commencing 1st April, 1955. The post is recognised for D.Obst. R.C.O.G.

Apply by 19th February to Group Secretary, West Ham Group Hospital Management Committee, Stratford, E.15, enclosing copies of recent testimonials.

POPLAR HOSPITAL, East India Dock-road, E.14. (120 Beds.) Required, HOUSE SURGEON (pre-registration post). Duties include inpatient, outpatient and casualty work. Recognised for F.R.C.S. Vacant 7th March.

Applications, stating age, nationality and qualifications, to the Hospital Secretary.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. (219 Beds.) Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER RESIDENT HOUSE SURGEON to Orthopædic, Fracture and Traumatic Department, E.N.T. Department, and SENIOR CASUALTY OFFICER, for a period of 6 months, vacant 22nd February, 1955.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15.

QUEEN CHARLOTTE'S AND CHELSEA HOSPITALS. Applications are invited from candidates having the M.R.C.O.G. for a part-time post of SENIOR REGISTRAR in the service of the Board of Governors of this Teaching Hospital Group, which will become vacant on 1st April, 1955. The successful applicant will be required to undertake duties at Queen Charlotte's Maternity Hospital and Chelsea Hospital for Women.

Applications, stating age, qualifications with dates, and previous appointments, together with the names of 3 referees, should be sent to the Secretary, 339, Goldhawk-road, London, W.6, not later than 28th February, 1955.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, London, E.15. HOUSE SURGEON (Male or Female) (third post) for 6 months commencing 16th March, 1955. Post recognised for F.R.C.S.

Applications, with copies of recent testimonials, to Group Secretary, West Ham Group Hospital Management Committee, Stratford, London, E.15, by 26th February, 1955.

SOUTH WESTERN HOSPITAL, Landor-road, S.W.9. RESIDENT HOUSE OFFICER (Senior House Officer grade) required to take charge of 32 surgical beds under the direction of the Surgical Consultant of Lambeth Hospital, Kennington; and also to work under the E.N.T. Consultant at the South Western Hospital.

Form of application from the Group Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11.

ROYAL EYE HOSPITAL. King's College Hospital GROUP. Applications are invited for the post of SENIOR HOUSE OFFICER from 1st April, 1955.

Applications, with copies of recent testimonials, should be made to the Secretary, The Royal Eye Hospital, St. George's-circus, S.E.1.

ROYAL FREE HOSPITAL. Applications are invited from registered Men and Women medical practitioners for the appointment of RESIDENT ASSISTANT PATHOLOGIST at the above Hospital. Salary in accordance with Ministry of Health scale for House Officers. The appointment is for 6 months in the first instance, subject to possible reappointment for a further 6 months. Duties to commence on 1st May, 1955.

Application forms may be obtained from the Secretary of the Board of Governors, Royal Free Hospital, Gray's Inn-road, London, W.C.1, to whom they should be returned not later than 1st March, 1955.

ROYAL FREE HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR CASUALTY OFFICER at the Royal Free Hospital, Gray's Inn-road, London, W.C.1. The appointment is full time, resident, for 6 months. Duties to commence 1st April, 1955. Salary and conditions of service in accordance with those laid down by the Ministry of Health for Senior House Officers.

Application forms may be obtained from the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 2nd March, 1955.

ROYAL FREE HOSPITAL. Applications are invited for the post of SENIOR REGISTRAR to the Anæsthetic Department, recognised within Senior Registrar establishment. Duties to commence on 1st April, 1955. The post is non-resident and for 1 year in the first instance. Salary in accordance with the scale laid down by the Ministry of Health for Senior Registrars.

Applications, together with the names of 3 referees, should be sent to the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1, not later than 21st February, 1955.

ROYAL FREE HOSPITAL. Applications are invited for the post of SENIOR REGISTRAR to the Infectious Diseases Department at the Royal Free Hospital, duties to commence 1st April, 1955. The appointment is for 1 year in the first instance. Candidates should be registered medical practitioners, hold a higher degree and have had experience of infectious diseases.

Formal application, giving details of experience, &c., together with the names of 3 referees, should be sent to the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1, not later than 21st February, 1955.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. Applications are invited from pre-registration and registered Female medical practitioners for the appointment of HOUSE SURGEON, vacant on 27th April, 1955, for a period of 6 months.

Form of application from the Secretary.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. Applications are invited from pre-registration and registered Women medical practitioners for the post of HOUSE PHYSICIAN, vacant on 21st April, 1955, for a period of 6 months.

Forms of application from the Secretary.

ST. GEORGE-IN-THE-EAST HOSPITAL, Raine-street, Wapping, E.1. Applications are invited for the post of HOUSE SURGEON (pre- or post-registration) required immediately. Tenable for 6 months. Salary, &c., in accordance with national scale.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Medical Superintendent.

ST. JAMES' HOSPITAL, Balham, S.W.12. Wandsworth HOSPITAL GROUP. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR (surgical). Post vacant 1st June.

Application forms (send stamped addressed foolscap envelope) obtainable from Group Secretary at above address, to be completed and returned by 26th February.

ST. JAMES' HOSPITAL, Balham, S.W.12. Wandsworth HOSPITAL GROUP. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR (physical medicine). Post vacant May. Department of Physical Medicine is a modern department and will shortly also include hydrotherapy.

Application forms (send stamped addressed foolscap envelope) obtainable from Group Secretary at above address to be completed and returned by 26th February.

ST. JAMES' HOSPITAL, Balham, S.W.12. Wandsworth HOSPITAL GROUP. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR (general medicine).

Application forms (send stamped addressed foolscap envelope) obtainable from Group Secretary at above address, to be completed and returned by 26th February.

ST. MARY'S HOSPITAL, W.2. Applications are invited for the post of Part-time (8 notional half-days) SENIOR REGISTRAR to the Bacteriology and V.D. Pathology Department. The appointment is for a first period of 12 months, as from 1st April, 1955, and is subject to annual review. The successful candidate will be required to devote the remaining 3 notional half-days to work in the Wright Fleming Institute, for which he will receive a salary so that his total remuneration is equal to that of a whole-time Senior Registrar.

Applications, stating nationality, date of birth, permanent address, qualifications, with National Health Service gradings, dates and details of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 2nd March, 1955.

ST. MARY'S HOSPITAL, W.2. Applications are invited from suitably qualified practitioners for the post of non-resident Whole-time REGISTRAR to the Surgical Unit (£850/£965). The appointment will be for a first period of 12 months with effect from 1st April, 1955.

Applications, stating nationality, date of birth, permanent address, qualifications with National Health Service gradings, dates and details of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 2nd March, 1955.

ST. MARY'S HOSPITAL, W.2. Applications are invited for the post of Part-time OUTPATIENT SURGICAL ASSISTANT (4 notional half-days per week). The appointment will be for a first period of 12 months with effect from 1st March, 1955; graded Senior House Officer.

Applications, stating nationality, date of birth, permanent address, qualifications with National Health Service gradings, date and details of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 23rd February, 1955.

ST. MARY ABBOTS HOSPITAL, Marloes-road, Kensington, W.8. FULHAM AND KENSINGTON HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the following posts:—

REGISTRAR in Anæsthetics. Position based at St. Mary Abbots Hospital (general hospital with 339 beds, including 64 maternity) but expected to work at other hospitals in the Group, if required. Post recognised for the D.A. Resident on nights on duty. Vacant 28th April, 1955.

REGISTRAR (surgical). Duties mainly general surgical, but including some orthopædic work. Post vacant 1st March, 1955.

Candidates may visit the Hospital by arrangement.

Applications (5 copies to be completed) to be submitted by 25th February, 1955, on forms obtainable from the Group Secretary (75.L), Fulham and Kensington Hospital Management Committee, 5, Collingham-gardens, London, S.W.5.

ST. MARK'S HOSPITAL, City-road, E.C.1. Part-time CLINICAL ASSISTANT (Honorary) required in the Outpatients Department, on Saturday mornings.

Further particulars obtainable from Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. Applications are invited for the post of RESIDENT ASSISTANT SURGEON (Senior Registrar) falling vacant on 15th May, 1955. The appointment is whole-time and resident. Duties will be both supervisory and administrative and cover the whole of the surgical work of the Hospital.

Further particulars and form of application, which must be returned not later than Monday, 7th March, 1955, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There is a vacancy for a Part-time NON-RESIDENT SENIOR SURGICAL REGISTRAR, attending 1 session per week on Monday morning.

Full particulars and form of application, which must be returned not later than Monday, 7th March, 1955, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There is a vacancy for an ORTHODONTIC REGISTRAR to the Dental Department (grade—Registrar). The appointment is full-time and non-resident.

Further particulars and form of application, which must be returned not later than Monday, 7th March, 1955, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

UNIVERSITY COLLEGE HOSPITAL, Gower-street, W.C.1. Applications are invited for the post of REGISTRAR in the Dermatological Department, whole-time (preferably) or may be part-time from 1st May, 1955.

Applications, with names of 2 referees, to Administrator and Secretary by 26th February, 1955.

WANSTEAD HOSPITAL, Hermon Hill, E.11. (191 Beds.) Applications are invited for the post of OBSTETRIC AND GYNÆCOLOGICAL HOUSE SURGEON, vacant 28th March, 1955. The appointment is recognised for the D.Obst.R.C.O.G.

Applications, with full details and copies of 2 recent testimonials, to be sent immediately to Secretary, Hospital Management Committee, Forest Group, Langthorne-road, E.11.

WHIPPS CROSS HOSPITAL, London, E.11. Leytonstone (NO. 10) HOSPITAL GROUP. Applications are invited for the post of HOUSE PHYSICIAN (pre-registration) at above Hospital. This post will be vacant from 1st April, 1955, but may be available on a locum basis approximately 2 weeks prior to that date.

Application forms from the Hospital Secretary to be returned by not later than 23rd February, 1955.

WHIPPS CROSS HOSPITAL, London, E.11. Leytonstone (NO. 10) HOSPITAL GROUP. Applications are invited for the post of HOUSE SURGEON (pre-registration post) in the Orthopædic Department at above Hospital.

Application forms from the Hospital Secretary to be returned by not later than 23rd February, 1955.

WILLESDEN GENERAL HOSPITAL, N.W.10. Central MIDDLESEX GROUP HOSPITAL MANAGEMENT COMMITTEE. CLINICAL ASSISTANT required for Skin Outpatients at above Hospital. 1 session per week. Post graded G.P. Annual appointment from 6th March, 1955. Present holder of post is applying.

Applications, with full particulars, and names of 2 referees, to Group Secretary, Acton-lane, N.W.10, by 23rd February.

WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY, 91, Dean-street, W.1. Applications are invited for the resident post of SENIOR HOUSE SURGEON, commencing 1st April, 1955. Candidates should have had surgical experience and previous neurological or neurosurgical experience would be an advantage.

Applications, stating age, qualifications, experience, together with the names and addresses of 2 referees, to reach the Hospital Secretary, by 28th February, 1955.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. Applications invited for post of SENIOR RESIDENT AND CASUALTY OFFICER (Registrar grade) for 1 year in first instance from 10th March, 1955. Board-residence £218 p.a.

Applications (8 copies), with names of 2 referees, to House Governor by 26th February.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. Applications invited for post of SENIOR SURGICAL REGISTRAR for 1 year in first instance from 1st May, 1955. Candidates must be F.R.C.S. Present Registrar will be an applicant.

Applications (12 copies), with names of 2 referees, to House Governor by 26th February.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. Applications invited for post of RESIDENT MEDICAL OFFICER (Female) at Parkwood Auxiliary Hospital and Convalescent Home, Swanley, Kent, for 1 year in first instance and renewable. Post vacant now, graded as Junior Hospital Medical Officer, and includes duties in outpatient clinics at Westminster Hospital. A deduction of £195 p.a. will be made from salary for board-residence.

Applications (4 copies), with names of 2 referees, to House Governor by 22nd February.

ASHFORD HOSPITAL, Ashford, Middlesex. Staines GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT SENIOR HOUSE OFFICER (Male) for Tuberculosis Unit of 56 Beds with some outpatient work. Post vacant 14th March, 1955.

Applications, stating age, qualifications, and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

ASHFORD HOSPITAL, Ashford, Middlesex. Staines GROUP HOSPITAL MANAGEMENT COMMITTEE requires RESIDENT HOUSE OFFICER (Male) for general medical and surgical duties (not suitable for pre-registration candidates).

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

BIDEFORD AND DISTRICT HOSPITAL, North Devon. (51 Beds.) HOUSE OFFICER post vacant 1st April. Flat available for married officer.

Applications to Group Secretary, 19, Alexandra-road, Barnstaple.

BIRMINGHAM ACCIDENT HOSPITAL, Birmingham, 15. (215 Beds.) RESIDENT HOUSE SURGEON, vacant March. Recognised by Royal College of Surgeons for Fellowship examinations. Appointments for period of 6 months in General Accident Service and (at applicant's request) includes a period in 32-bedded Burns Unit.

Apply Administrator.

BIRMINGHAM AND MIDLAND EAR AND THROAT HOSPITAL, Edmund-street, BIRMINGHAM, 3. Required, SENIOR HOUSE OFFICER or HOUSE OFFICER (including pre-registration), according to experience.

Detailed applications, with copies of 2 recent testimonials, to the Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM. MONYHULL HALL HOSPITAL (1210 Beds. Adult and Mental Defectives and E.S.N. Children.) Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER (resident or non-resident). Recognised for D.P.M. Post now vacant.

Applications to Medical Superintendent, Monyhull Hall Hospital, Monyhull Hall-road, Birmingham, 14.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) Coventry and Warwickshire and Gulson Hospitals

REGISTRAR in Anæsthetics for Coventry and Warwickshire Hospital, Coventry (354 Beds). Experience specialty essential. Recognised for F.F.A.R.C.S. Married accommodation may be available.

(2) Shrewsbury Group Hospital Management Committee, Royal Salop Infirmary, Shrewsbury

(*a*) SURGICAL REGISTRAR (resident). Duties mainly at Royal Salop Infirmary and Copthorne Hospital (170 surgical beds). Recognised for F.R.C.S. High qualification an advantage.

(*b*) Whole-time REGISTRAR in Psychiatry for Shelton Hospital, Shrewsbury (1000 Beds). Hospital approved training establishment. Previous experience general medicine desirable.

(3) Robert Jones and Agnes Hunt Orthopædic Hospital, Oswestry

ORTHOPÆDIC REGISTRAR to commence 1st April. First year at peripheral centre, Shrewsbury, and second year at base hospital, Oswestry.

Application forms from Group Secretaries, to be returned before 28th February, 1955. Candidates may visit hospitals.

BIRMINGHAM, 29. SELLY OAK HOSPITAL. (1059 Beds.) SENIOR HOUSE OFFICER (anæsthetics), resident or non-resident. Exceptional opportunities for reading for higher qualifications.

Apply Medical Superintendent with details of qualifications, experience, age, and copies of 3 recent testimonials.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE BIRMINGHAM MATERNITY HOSPITAL. Applications are invited from registered medical practitioners for the post of RESIDENT OBSTETRIC HOUSE SURGEON, vacant 1st May, 1955. The appointment is recognised for the M.R.C.O.G.

Application forms obtainable from the House Governor, the Birmingham and Midland Hospitals for Women, Showell Green-lane, Sparkhill, Birmingham, 11, to be returned not later than 5th March, 1955. G. A. PHALP, Secretary.

BLACKPOOL. VICTORIA HOSPITAL. (344 Beds.) HOUSE PHYSICIAN. Post vacant 1st April, 1955. Recognised for Pre-registration Service. Provides excellent opportunity for gaining experience in a department under the control of Consultant Physicians.

Applications, with references or names of referees, should be sent to the Hospital Secretary.

BRADFORD A AND B HOSPITAL MANAGEMENT COMMITTEES. JUNIOR HOUSE OFFICER required for newly formed active Geriatric Admission Unit. The major portion of the duties will be carried out at St. Luke's Hospital, Bradford.

Applications, stating age, nationality, qualifications and experience, and copies of testimonials, to the Secretary, Royal Infirmary, Bradford.

BRADFORD ROYAL INFIRMARY. Senior House Surgeon (Thoracic Unit), vacant 1st March, 1955. Salary £745 p.a., less £150 p.a. residential emoluments.

Applications, stating age, experience, nationality and qualifications, with copy testimonials, to Secretary.

BRADFORD ROYAL INFIRMARY. House Surgeon (general), vacant 20th March, 1955. Recognised for F.R.C.S. and pre-registration purposes. Salary £425–£525 p.a., less £125 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to Secretary.

BRADFORD. ST. LUKE'S MATERNITY HOSPITAL. HOUSE OFFICER (obstetrics/gynæcology), vacant 1st April. Recognised for D.Obst.R.C.O.G. and M.R.C.O.G. Salary £425–£525 p.a., less £125 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRAINTREE, ESSEX. BLACK NOTLEY HOSPITAL. (544 Beds.) Applications invited for post of HOUSE PHYSICIAN in the medical and pædiatric wards of above Hospital. First, second, third, or pre-registration post; tenable for 6 months.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

BRIGHTON AND LEWES HOSPITAL MANAGEMENT COMMITTEE GROUP OF HOSPITALS. HOUSE SURGEON required in the E.N.T. Department of the above Group, vacant in March. Recognised for F.R.C.S. and D.L.O.

Applications, with details of experience, age, and qualifications, and naming 2 referees, to be sent to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRIGHTON. SUSSEX EYE HOSPITAL, Eastern-road, BRIGHTON, 7. (56 Beds.) SENIOR HOUSE SURGEON (Senior House Officer) and HOUSE SURGEON (House Officer) required mid-April. Posts recognised for F.R.C.S. under 23 (b).

Applications, stating age, qualifications and experience, together with the names of 2 referees, to the Administrative Officer.

BRISTOL (near). HAM GREEN HOSPITAL, Pill, near BRISTOL. Applications are invited for the post of HOUSE OFFICER in the tuberculosis wards (188 Beds) of the above Hospital. The Hospital is fully equipped for the modern treatment of pulmonary tuberculosis, including regular major thoracic surgery.

Apply Secretary, Ham Green Hospital, Pill, near Bristol.

BISHOP'S STORTFORD, HERTFORDSHIRE. HAYMEADS HOSPITAL. (Midway between London and Cambridge. Main Line from Liverpool Street.) Applications are invited for the following appointments:—

HOUSE OFFICER (medicine), Male or Female. Pre-registration or first or second post—to commence 7th April, 1955, for 6 months. Salary £425–£475, less £125 p.a. in respect of resident emoluments.

SENIOR HOUSE OFFICER (medicine), for duties mainly in Tuberculosis Unit of 43 male and 23 female beds. Salary £745 p.a., less £130 in respect of residential emoluments. To commence 1st April, 1955, for 12 months.

Applications, stating qualifications, nationality, age and experience, with copies of recent testimonials or names of 2 referees, to Hospital Secretary.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. BURY GENERAL HOSPITAL. HOUSE OFFICER (surgery), pre-registration post, falling vacant 1st March.

Apply, stating age, qualifications, experience, and names of 2 referees to H. WILKINSON, Group Secretary, Bury General Hospital, Walmersley-road, Bury.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in Pædiatrics. The post is based on Bury General Hospital, but will include duties at other hospitals in the Group.

Apply, stating age, qualifications, experience, and names of 2 referees, to H. WILKINSON, Group Secretary, Bury General Hospital, Bury, Lancs.

BURY ST. EDMUNDS. WEST SUFFOLK GENERAL HOSPITAL. (289 Beds.) SENIOR HOUSE OFFICER for casualty and orthopædic duties required early May. Post recognised for F.R.C.S.

Inquiries and applications to Hospital Secretary.

CAERPHILLY DISTRICT MINERS' HOSPITAL. (175 Beds for acute medicine and surgery.) HOUSE SURGEON (pre-registration appointment) required at above Hospital. Married quarters available.

Apply to the Secretary, Rhymney and Sirhowy Valleys Hospital Management Committee.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. Medical REGISTRAR, vacant 14th May, for 1 year in the first instance, reviewable annually.

Apply, with full particulars and names of 3 referees, to Secretary by 5th March.

CHATHAM. ALL SAINTS' HOSPITAL. Medway and GRAVESEND HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in General Medicine required 21st March, 1955. Appointment will be for 12 months and successful candidate will be required to do duty at other hospitals in Group if necessary. Salary £745 p.a., less £150 for residential emoluments.

Applications, giving full details with copies of 3 recent testimonials, to be addressed to Hospital Secretary.

CARDIFF HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Obstetrics and Gynæcology required.

Further particulars and form of application from Group Secretary, 44, Cathedral-road, Cardiff.

CARDIFF. THE UNITED CARDIFF HOSPITALS. Applications are invited for the post of SENIOR HOUSE OFFICER in Surgery at Llandough Hospital. Post falls vacant in April.

Application forms obtainable from the Secretary, United Cardiff Hospitals, Cardiff Royal Infirmary.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. HOUSE SURGEON (pre-registration post), general surgery with duties in genito-urinary.

Applications, stating age, qualifications, &c., with copies of recent testimonials and the names of referees, should be sent to the Secretary at above address.

CHELTENHAM GENERAL AND EYE HOSPITAL. (170 Beds.) HOUSE SURGEON (pre-registration or otherwise) required middle March.

Applications, together with the names of 2 referees, to be sent to the Group Secretary, General Hospital, Cheltenham.

CHELTENHAM GENERAL AND EYE HOSPITAL. (170 Beds.) RESIDENT SENIOR HOUSE OFFICER (casualty) required.

Applications, giving details of qualifications and experience and names of 3 referees, to the Group Secretary, Sandford-road, Cheltenham.

CHEPSTOW, MONMOUTHSHIRE. ST. LAWRENCE HOSPITAL. (100 plastic surgery, 50 orthopædic beds.) PLASTIC SURGERY, JAW INJURIES AND BURNS CENTRE. SENIOR HOUSE OFFICER in Plastic Surgery required. Previous experience in specialty not essential. The successful candidate will receive a thorough training in plastic surgery and burns. Hospital intakes from most of Wales and provides extensive experience. There is another Senior House Officer in Plastic Surgery, and also a Senior House Officer in Orthopædics. Salary £745, less £150 board-residence.

Write, quoting 2 referees, to T. A. JONES, Group Secretary, 64, Cardiff-road, Newport, Mon.

CHESTERFIELD ROYAL HOSPITAL. (324 Beds.) CASUALTY OFFICER required. Appointment recognised for pre-registration purposes.

For interview please apply M. H. BOONE, Secretary, Chesterfield Hospital Management Committee.

CHESTERFIELD ROYAL HOSPITAL. (324 Beds.) 2 HOUSE SURGEONS required. Posts recognised for Pre-registration Service and F.R.C.S. training.

For interview please apply M. H. BOONE, Secretary, Chesterfield Hospital Management Committee.

COLCHESTER. BRITISH LEGION SANATORIUM, NAYLAND, COLCHESTER, ESSEX. (207 Beds for treatment of early pulmonary tuberculosis in women.) IPSWICH GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications invited for the appointment of SENIOR HOUSE OFFICER. No married quarters available. Deduction for residential emoluments £150 p.a.

Applications, with 2 testimonials, to the Physician-Superintendent.

CROYDON GROUP HOSPITAL MANAGEMENT COM-MITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR (obstetrics and gynæcology) for duties mainly at Mayday Hospital (80 obstetric and 47 gynæcological beds) and St. Mary's Maternity Hospital (33 obstetric beds). Post is resident and recognised for M.R.C.O.G. Vacant 20th May.

Application forms obtainable from GEORGE A. PAINES, Secretary, Hospital Management Committee, General Hospital, London-road, Croydon, to be returned by 23rd February.

DERBY CITY HOSPITAL. (256 Beds. Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT SURGICAL REGISTRAR required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 21st February, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (396 Beds. Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (orthopædics) required. Post becomes vacant 1st May, 1955. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 21st February, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

DORCHESTER. DORSET COUNTY HOSPITAL. (113 Beds.) HOUSE SURGEON required (Male or Female). Post vacant mid-February and tenable for 6 months. Recognised for F.R.C.S. examination and approved for Pre-registration Service.

Applications, stating age, experience, qualifications and nationality, together with copy testimonials, to Group Secretary, West Dorset Hospital Management Committee, Damers-road, Dorchester, Dorset, immediately.

DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP. BIRMINGHAM REGION.

The Guest Hospital, Dudley (154 Beds)

HOUSE OFFICER (surgical), pre-registration. Post now vacant.

Wordsley Hospital, near Stourbridge (478 Beds)

SENIOR HOUSE OFFICER (resident), Anæsthetist. Post now vacant. In addition to general surgery, experience is available in gynæcology and there is a major Orthopædic Unit. Regional Plastic Surgery Unit at this Hospital.

SENIOR HOUSE OFFICER (surgical).

Applications, stating age, experience, with copies of 3 recent testimonials, to Group Secretary, The Guest Hospital, Dudley Worcs.

DONCASTER ROYAL INFIRMARY. (330 Beds.) DONCASTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON. Approved as pre-registration post and recognised for F.R.C.S.

Applications to the Secretary to the Committee at the Doncaster Royal Infirmary.

EAST ANGLIAN REGIONAL HOSPITAL BOARD.

(1) SURGICAL REGISTRAR, Peterborough Memorial Hospital. General Hospital with busy Surgical Department providing wide range of work and experience. Appointment for 1 year, renewable for second year.

(2) SURGICAL REGISTRAR, West Norfolk and King's Lynn General Hospital (144 Beds). Post provides wide range of experience and is recognised for F.R.C.S. Appointment for 1 year, renewable for second year.

(3) ANÆSTHETIC REGISTRAR, West Norfolk and King's Lynn Hospital (144 Beds). Single accommodation available. Post provides wide experience and recognised for D.A. Appointment for 1 year, renewable for second year.

Applications, stating age, experience, and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 21st February, 1955. Candidates invited to visit hospitals by direct arrangement with Hospital Management Committee Secretary at the hospital.

ENFIELD. WAR MEMORIAL HOSPITAL, Chase Side, ENFIELD, MIDDLESEX. ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER required for general medical and surgical duties in this acute General Hospital of 61 Beds. 12 months appointment. £135 p.a. deducted for board, lodging, laundry.

Applications, with the names and addresses of 2 referees, to the Group Secretary, Chase Farm Hospital, The Ridgeway, Enfield, Middlesex.

EPPING GROUP HOSPITAL MANAGEMENT COMMITTEE. ST. MARGARET'S HOSPITAL, EPPING (485 Beds), AND HONEY LANE HOSPITAL, WALTHAM ABBEY (118 Beds). HOUSE PHYSICIANS, 2 vacancies occurring 20th March, 1955, for fully registered practitioners. Salary on national scale, less deduction for board, lodging, &c. The successful candidates will be required to reside for 3 months at each Hospital.

Applications, with copies of 2 recent testimonials, to the Group Secretary, St. Margaret's Hospital, Epping, by 18th February, 1955.

EPSOM, SURREY. WEST PARK HOSPITAL (for all stages of nervous and mental disorders). SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for 2 appointments of REGISTRAR in Psychiatry at above Hospital. Candidates may be of either sex. Single residential quarters are available.

Applications (5 copies) should be made on forms to be obtained from the Secretary to the Hospital Management Committee at the Hospital, to whom they should be returned not later than 18th February.

EXETER. ROYAL DEVON AND EXETER HOSPITAL. EXETER AND MID-DEVON HOSPITALS MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of HOUSE SURGEON, vacant 23rd March, 1955. This is a recognised pre-registration appointment.

Applications, with copies of 2 recent testimonials, to the Hospital Secretary by 19th February, 1955.

FARNBOROUGH HOSPITAL, Farnborough, Kent. (800 Beds.) SENIOR HOUSE OFFICER in Anæsthetics required for 1 year, from 22nd March, 1955. Recognised for D.A. and F.F.A.R.C.S.

Apply, stating age, qualifications with dates and experience, and naming 3 referees, to the Administrative Officer by 19th February, 1955.

GLASGOW. ROYAL HOSPITAL FOR SICK CHILDREN, YORKHILL, GLASGOW. Applications are invited for the posts (2) of SENIOR HOUSE OFFICER (resident) in Surgical Prediatrics at the above Hospital. National Health Service salary and conditions of service.

Applications, with names of 3 referees, to be lodged with the Secretary, Board of Management for Glasgow and District Childrens Hospitals, 86, St. Vincent-street, Glasgow, C.2, by 26th February.

GLASGOW, N.1. STOBHILL GENERAL HOSPITAL. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER in the Acute Geriatric Unit (70 Beds/for assessment and rehabilitation) supervised by a Consultant Physician specialising in geriatrics. The appointment offers excellent clinical experience in the diagnosis and treatment of acute and other illnesses in the elderly, and will be for 2 years in the first instance.

Applications, stating age, qualifications and experience, with the names of 2 referees, to be sent to the Medical Superintendent.

GREAT YARMOUTH AND GORLESTON GENERAL HOSPITAL, DENE SIDE, GREAT YARMOUTH. HOUSE SURGEON (Male or Female) required. Post vacant 1st April, 1955. The Hospital is staffed by a Consultant General Surgeon and a Consultant E.N.T. Surgeon, and is regularly visited by Consultant staff from the Norfolk and Norwich Hospital. The post is a pre-registration post at a salary of £425, £475, or £525 p.a. according to experience, less £125 p.a. for residence. Membership of a Medical Defence Society is a condition of appointment.

Applications, stating age, qualifications, and experience, with names of 2 referees, to Hospital Secretary.

HULL. MATERNITY HOSPITAL. (74 Beds.) HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointments of 2 HOUSE OFFICERS (obstetrics). 1 post vacant 1st April, the other 1st May, and are tenable for 6 months. The posts are recognised for the M.R.C.O.G. examinations.

Applications to Hospital Secretary, Maternity Hospital, Hedon-road, Hull, as soon as possible, stating which appointment desired.

HULL. VICTORIA HOSPITAL FOR SICK CHILDREN, Park-street. HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required from 20th February, 1955. Registration or pre-registration post. 6-monthly term; counts toward the D.C.H. qualification. Salary according to national scale.

Send replies, with testimonials, to the Hospital Secretary.

HULL. VICTORIA HOSPITAL FOR SICK CHILDREN, Park-street. HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. Locum SENIOR HOUSE OFFICER required for 2 weeks from 26th February and possibly longer on a weekly basis.

Applications, giving full details, to be sent to the Hospital Secretary.

HADDINGTON, EAST LOTHIAN. ROODLANDS GENERAL HOSPITAL. RESIDENT HOUSE SURGEON required for 1st April, 1955. The post offers excellent experience and is recognised for Pre-registration Service.

Applications should be lodged immediately with Secretary, East Lothian Hospitals Group Board of Management, 31, Court-street, Haddington, stating experience and giving names of 2 referees.

HAREFIELD HOSPITAL, Harefield, Middlesex. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR required at above Hospital. Previous experience in general medicine and in the treatment of tuberculosis essential. The Hospital has approximately 450 beds for the treatment of tuberculosis in all its forms, a non-tuberculosis Thoracic Surgical Unit of 100 Beds and 100 general medical and surgical beds. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, the Secretary, Harefield and Northwood Group Hospital Management Committee, Mount Vernon Hospital, Northwood, Middlesex, by 22nd February, 1955.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) HOUSE SURGEON (resident) required. Pre-registration post, vacant 3rd March, 1955. National scale of salary.

Apply to Hospital Administrator.

HASTINGS. ST. HELEN'S HOSPITAL. (497 Beds.) HOUSE SURGEON required. Resident pre-registration post vacant 6th March. Male or Female. National scale of salary.

Apply to Hospital Administrator.

HESWALL, CHESHIRE. CLEAVER HOSPITAL. (220 Beds.) CENTRAL WIRRAL GROUP. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER. The post offers good experience in modern treatment of tuberculosis. The Hospital deals with acute cases, and minor and major surgery is carried out by members of the Liverpool Chest Surgical Unit. Applicants should have had previous experience in the treatment of tuberculosis and a knowledge of chest surgical procedure would be an advantage. Applications from ex-patient practitioners will be considered. Salary, terms and conditions of service for hospital medical and dental staffs (England and Wales) will apply.

Applications, including names of 3 referees, should be addressed to the Physician-Superintendent as soon as possible.

HITCHIN, HERTFORDSHIRE. LISTER HOSPITAL. Applications are invited for the post of RESIDENT HOUSE PHYSICIAN, vacant 1st March, 1955. Recognised as pre-registration post.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Medical Administrator as soon as possible.

ILFORD MATERNITY HOSPITAL, Eastern-avenue, ILFORD. There will be a vacancy for a SENIOR HOUSE OFFICER at the above Hospital on 14th March, 1955. Salary will be at the rate of £745 p.a., less emoluments. This post is recognised for training for the D.Obst.R.C.O.G.

Applicants should have been registered not less than 1 year and should send applications, accompanied by copies of 3 testimonials, to the undersigned within 7 days of the appearance of this advertisement.

H. F. HARRIS, Secretary,
Ilford and Barking Group Hospital Management Committee.
King George Hospital, Ilford.

ILKLEY. MIDDLETON HOSPITAL. (430 Beds.) RESIDENT SENIOR HOUSE OFFICER (surgical) required for Major Thoracic Surgical Unit at the above Hospital.

Applications, stating age, nationality, qualifications and experience, to Hospital Secretary.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) EAST ANGLIAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR. Post recognised for D.A. and F.F.A.R.C.S. Appointment for 1 year, renewable for second year.

Applications, stating age, experience and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 28th February, 1955. Candidates invited to visit Hospital by direct arrangement with Hospital Management Committee Secretary at the Hospital.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) Applications are invited for the post of HOUSE SURGEON to the Fracture and Orthopædic Department. Approved pre-registration post.

Applications, with copies of recent testimonials, to the Hospital Secretary.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. South WEST MIDDLESEX HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required for Dermatological Unit. Candidates must have held medical and surgical house posts and previous experience in dermatology desirable. Post suitable for anyone intending to specialise in this subject.

Applications, stating age, nationality, qualifications and experience with copies of up to 3 recent testimonials, to Group Secretary, West Middlesex Hospital, Isleworth, by 22nd February, 1955.

KINGSTON HOSPITAL, Wolverton-avenue, Kingston-on-Thames. KINGSTON GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from suitably qualified medical officers for the following posts which become vacant on 1st April, 1955.

1 SENIOR HOUSE OFFICER (general surgery).
1 SENIOR HOUSE OFFICER (orthopædic and casualty).

Above posts recognised for F.R.C.S.

In addition the following locum appointment is available :—
SENIOR HOUSE OFFICER (orthopædic and casualty) from 18th March, 1955, to 31st March, 1955, inclusive.

Applications, stating age, qualifications and experience, together with 2 recent testimonials, should reach the Physician-Superintendent of the Hospital not later than 19th February, 1955.

LEEDS, 2. PUBLIC DISPENSARY AND HOSPITAL. LEEDS A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of CASUALTY OFFICER (Senior House Officer) at the above Hospital. The appointment will be for a period of 1 year. Salary in accordance with the agreed terms and conditions of service of hospital medical and dental staffs, with an appropriate deduction in respect of board, lodging, &c.

Applications, stating age, qualifications, experience, &c., together with the names of 2 referees, to be forwarded to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee.

Administrative Offices, St. James's Hospital, Leeds, 9.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the following REGISTRAR posts :—

Chest Diseases

Scotton Banks Sanatorium, Knaresborough (306 Beds) (resident).

Obstetrics and Gynæcology

Wakefield A and B Groups (with occasional duties in Pontefract and Goole Groups) (non-resident). Offers good experience but is not at present recognised by the R.C.O.G. for membership purposes. Aggregate of 120 obstetric and 50 gynæcological beds.

Orthopædic Surgery

(*a*) Woodlands Orthopædic Hospital, Rawdon (100 Beds), and Orthopædic Outpatient Department, Bradford Royal Infirmary. Offers excellent training in all branches of accident and orthopædic surgery. May be non-resident.

(*b*) Royal Bath Hospital, Harrogate (40 orthopædic beds). Duties in connection with the Regional Rheumatism Scheme (resident).

Psychiatry

(*a*) Broadgate Hospital, Beverley (600 Beds). Accommodation for single person (resident/non-resident).

(*b*) Psychiatric Unit, St. James's Hospital, Leeds. Offers special opportunity for experience with neurotic and psychosomatic patients (resident/non-resident).

If desired facilities for attendance at the Leeds University will be provided if the successful candidates are studying for the D.P.M.

Thoracic Surgery

Regional Thoracic Centre (56 Beds), Pinderfields General Hospital, Wakefield. Previous experience in thoracic work desirable. The beds are under the charge of the Consultants to the Teaching Hospital and the post may in future be linked with the Unit at the General Infirmary at Leeds (resident married quarters available).

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 24th February 1955.

LEICESTER ISOLATION HOSPITAL AND CHEST UNIT. (266 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time REGISTRAR (chest and infectious diseases) required. This Hospital offers interesting work, having Units for infectious diseases and all forms of chest diseases, complete Thoracic Surgical Unit and outpatient sessions for chest diseases and cardiology. Single accommodation is available. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 21st February, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

LIVERPOOL, 20. BOOTLE HOSPITAL. House Surgeon required. Recognised pre-registration post.

Apply to Secretary, Walton Hospital, Liverpool, 9.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. ROYAL SOUTHERN HOSPITAL. Applications are invited for the following House Officer posts which are open to registered practitioners and pre-registration applicants for the 6 months from 1st March, 1955.

ORTHOPÆDIC HOUSE SURGEON to Professorial Unit.
CASUALTY OFFICER.

Apply as soon as possible on forms obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LOWESTOFT AND NORTH SUFFOLK HOSPITAL, LOWESTOFT. (99 Beds.) SENIOR HOUSE SURGEON (resident) required. Salary £745 p.a. Furnished flat available for married Officer, if required. The Hospital has a Consultant General Surgeon and is regularly visited by Consultants in all specialties from the Norfolk and Norwich Hospital.

Applications, stating age, qualifications and experience, with names and addresses of 2 referees, to Hospital Secretary.

MAIDENHEAD HOSPITAL, St. Luke's-road, Maidenhead. Applications invited from registered practitioners for post of CASUALTY OFFICER, vacant 23rd February. Recognised for F.R.C.S. Salary on House Officer scale, plus £50 p.a.

Applications, stating age, qualifications, nationality, and experience, with copies of testimonials or names of 3 referees, to Hospital Secretary.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RECEIVING ROOM OFFICER. Post vacant now. Salary £745 a year, with a deduction of £150 a year for residential emoluments.

Applications to the Administrative Officer at the Hospital as soon as possible.

MANCHESTER REGIONAL HOSPITAL BOARD. Blackburn AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. RESIDENT REGISTRAR (obstetrics/gynæcology) required 1st April, 1955. Post recognised for M.R.C.O.G. Based on Queen's Park Hospital, Blackburn (a general hospital with 83 obstetric/gynæcological beds) with duties at Blackburn Royal Infirmary and Accrington Victoria Hospital.

Application forms obtainable from, and returnable to, the Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

MANCHESTER REGIONAL HOSPITAL BOARD. Bury AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of REGISTRAR in Orthopædics, based at Bury General Hospital.

Apply, stating age, qualifications, experience, and names of 2 referees, to H. WILKINSON, Group Secretary.

Bury General Hospital, Bury, Lancs.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of REGISTRAR in Pathology in the Wigan and Leigh Hospital Management Committee Group Laboratory established at the Royal Albert Edward Infirmary, Wigan. Post vacant 1st March, 1955. The Laboratory is well equipped and recognised for the D.Path. There are excellent opportunities for gaining extensive experience in all branches of pathology.

Applications, with full particulars, and names of 2 referees, to Secretary, Wigan and Leigh Hospital Management Committee, Knowsley House, Wigan-lane, Wigan.

MANCHESTER REGIONAL HOSPITAL BOARD. Wigan AND LEIGH HOSPITAL MANAGEMENT COMMITTEE. REGISTRAR in Radiodiagnosis required for duties mainly at the Royal Albert Edward Infirmary, Wigan (resident or non-resident). Post now vacant. Applicants should preferably hold the D.M.R.(D).

Applications, giving the names of 2 referees, should be sent to the undersigned as soon as possible.

Knowsley House, Wigan. T. W. HURST, Secretary.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL EYE HOSPITAL. Applications are invited for SENIOR HOUSE OFFICER post. Salary £745 p.a., less £155 p.a. for residential emoluments.

Application forms may be obtained from the undersigned.

H. R. NORTH, General Superintendent.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. 1 HOUSE OFFICER (pædiatrics) required, post-registration, for new post commencing 1st April, 1955. The Hospital has a Midwifery Unit of 73 Beds and there are also thoracic surgery beds on the Pædiatric Unit. Hospital recognised for training for Diploma in Child Health.

Forms from Secretary.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General Hospital—433 Beds.) 1 HOUSE OFFICER (general surgery) required, pre-registration post. Recognised for F.R.C.S. examination. Post now vacant.

Application forms from Secretary.

NEWCASTLE GENERAL HOSPITAL. (847 Beds.) NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. The resident post of SENIOR HOUSE OFFICER (Male), Urological Unit (51 Beds), becomes vacant at the end of February and is tenable for 12 months.

Applications should be addressed to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4, together with 1 copy of 2 recent testimonials, by 18th February, 1955.

NEWCASTLE REGIONAL HOSPITAL BOARD.

Newcastle upon Tyne Hospital Management Committee

REGISTRAR GENERAL SURGEON (whole-time) for Surgical Clinic No. 1, Newcastle General Hospital. Accommodation available.

South Shields Hospital Management Committee

REGISTRAR ANÆSTHETIST (whole-time), resident or non-resident. Accommodation available. Post recognised for F.F.A.R.C.S.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 7 days.

St. George's Hospital, Morpeth (1210 Beds)

REGISTRAR PSYCHIATRIST (whole-time), resident. Single accommodation only available.

Applications, with names and addresses of 3 referees, to Regional Psychiatrist, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 7 days.

Hexham Hospital Management Committee

Locum Tenens REGISTRAR ANÆSTHETIST (whole-time) for approximately 2–3 months.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, immediately.

NOTTINGHAM. CITY HOSPITAL. (804 Beds.) Sheffield REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (thoracic surgery) required. Post becomes vacant 2nd April, 1955. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 21st February, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

NOTTINGHAM. CITY HOSPITAL. (804 Beds.) Applications are invited for the post of GYNÆCOLOGICAL HOUSE OFFICER (recognised for pre-registration purposes), which will be graded Senior House Officer or House Officer in accordance with experience. Recognised for M.R.C.O.G. Post vacant on 1st April.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER (orthopædic and fracture). The post offers exceptional experience in traumatic surgery. Duties to commence as soon as possible.

Applications, stating age, qualifications, and experience, together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM. HIGHBURY HOSPITAL. Senior SURGICAL HOUSE OFFICER required at the above Hospital. Good opportunity for obtaining experience in all types of general surgery. Duties to commence on 1st March, 1955.

Applications, stating age, qualifications and experience, together with copies of testimonials to be sent to Group Secretary, Nottingham General Hospital.

NEWTON ABBOT HOSPITAL, S. Devon. Senior House OFFICER (medicine), Male or Female, required approximately 4th March, 1955. Duties divided equally between 20 acute medical beds in general section and 140 geriatric beds. This Officer is also required to stand in when Senior House Surgeon otherwise engaged. Married quarters available.

Applications, stating qualifications, nationality, and age, with copy testimonials, to be sent to the Group Secretary, Torquay District Hospital Management Committee, 62/64, East-street, Newton Abbot, S. Devon.

ORMSKIRK COUNTY HOSPITAL. Wigan-road, ORMSKIRK, LANCS. (467 Beds.) HOUSE SURGEON (general surgery). Resident appointment for 6 months commencing 1st March, 1955. Post approved for pre-registration. Ministry of Health terms and conditions of service. Salary £425–£525 p.a., according to experience, less £125 p.a. for residential emoluments.

Applications, with age, qualifications and experience and 2 names for reference, to the undersigned, at above address, as soon as possible. H. E. BECK, Group Secretary.

OXFORD REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR in General Medicine to the Kettering Group of hospitals with duties mainly at Kettering General Hospital. The appointment will be for 1 year and eligible for extension to 2 years. Single accommodation is available.

Applications on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, must reach him by 21st February, 1955.

PORTSMOUTH AND ISLE OF WIGHT AREA PATHOLOGICAL SERVICE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR in Pathology, vacant on 1st June, 1955. The successful candidate will be expected to do a tour of duty in the Departments of Bacteriology, Hæmatology, Histology, and Biochemistry at the Central Laboratory, and may also be required to work in any of the laboratories covered by the Service. The Laboratory is recognised for the Diploma in Pathology.

Forms of application may be obtained from the Acting Group Secretary, Portsmouth Group Hospital Management Committee, 35, Grove-road South, Southsea, which should be returned to him duly completed on or before 21st February, 1955. Candidates are invited to see the Central Laboratory, Milton-road, Portsmouth, and should contact the Senior Pathologist.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment, vacant now, of REGISTRAR in the Chest Services of the Group for duties at the Portsmouth Chest Clinic and the tuberculosis wards at the Infectious Diseases Hospital and Saint Mary's Hospital, Portsmouth, including experience with a major Thoracic Surgery Unit.

Forms of application may be obtained from the Acting Group Secretary, Portsmouth Group Hospital Management Committee, 35, Grove-road South, Southsea, which should be returned to him duly completed on or before 21st February, 1955. Candidates may visit the above Clinic and Hospitals by arrangement with the Acting Group Secretary.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointments:—

GYNÆCOLOGICAL HOUSE SURGEON for duties at Queen Alexandra Hospital (50 gynæcological beds), vacant now. Post recognised for M.R.C.O.G. Pre-registration post. At the end of 6 months successful candidate would be offered post at St. Mary's Hospital, Portsmouth (50 obstetric, 40 gynæcological beds). Recognised for M.R.C.O.G. and D.Obst.R.C.O.G.

Royal Portsmouth Hospital

SENIOR HOUSE SURGEON (70 surgical beds), vacant now.

Saint Mary's Hospital

SENIOR HOUSE SURGEON required for casualty work and general surgery. Vacant now.

HOUSE PHYSICIAN (pædiatric), vacant 16th February. Pædiatric Unit of 53 Beds, and the post is recognised for candidates preparing for the D.C.H.

Infectious Diseases Hospital (310 Beds—Fever and T.B.)

SENIOR HOUSE OFFICER, vacant 1st May.

Applications, stating age, experience and qualifications, together with names of 2 referees, should be forwarded as soon as possible to L. C. ROGERS.

35, Grove-road South, Southsea.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL GENERAL HOSPITAL GROUP.

Department of Obstetrics and Gynæcology

HOUSE SURGEON in Obstetrics and Gynæcology, vacant 17th April, 1955. Recognised for the Membership of the Royal College of Obstetricians and Gynæcologists. Wide experience can be obtained in obstetrics, including antenatal and post-natal clinics.

Applications, stating age, nationality, qualifications and experience, with names of 3 referees, to be sent to—

ARTHUR R. CASH, Group Secretary.

7, Nelson-gardens, Stoke, Plymouth.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE. (316 Beds and large Outpatient Department. Committee's Base Hospital serving population of 174,000. Recognised for F.R.C.S., M.R.C.O.G., D.Obst.R.C.O.G., D.C.H., F.F.A.R.C.S., D.A.) PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (surgical) (to include duties at the Porth and District Hospital).

Applications, stating age, qualifications, and experience, together with copies of 2 recent testimonials, to be sent to the Group Secretary, Courthouse-street, Pontypridd.

READING. BATTLE HOSPITAL. (374 Beds.) Applications are invited from registered and provisionally registered medical practitioners for post of RESIDENT JUNIOR HOUSE SURGEON in the Area Accident and Orthopædic Department, vacant 1st March, 1955. F.R.C.S. recognised. Also casualty duties. Salary £425–£525 p.a., less £125 board-residence.

Apply, stating age, qualifications with dates, nationality, present post, with copy of 1 recent testimonial, to Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. (403 Beds.) Applications are invited from registered and provisionally registered medical practitioners (Male or Female), for the resident post of JUNIOR HOUSE PHYSICIAN (pædiatric and E.N.T.), vacant 15th March, 1955, for 6 months.

Write, stating age, qualifications with dates, nationality, together with 1 copy of recent testimonial, to Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. (403 Beds.) Applications are invited from registered and provisionally registered medical practitioners (Male or Female) for the resident post of JUNIOR HOUSE SURGEON (E.N.T.), vacant 21st February, 1955. Salary £425–£525 p.a., less £125 board-residence.

Write, stating age, qualifications with dates, nationality, with copy of 1 recent testimonial, to Secretary.

REDHILL COUNTY HOSPITAL. Earlswood Common, REDHILL, SURREY. Locum HOUSE PHYSICIAN, required for 2 weeks from 14th February. May be held by pre-registration intern.

Apply to Group Secretary (Redhill 3581, Ext. 20).

RHYL. ROYAL ALEXANDRA HOSPITAL. Clwyd and DEESIDE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for appointment, as from 18th April, 1955, of HOUSE PHYSICIAN at the above Hospital.

Applications, stating age, qualifications and experience, with copies of 2 recent testimonials, to be sent to the Group Secretary, "Rhianfa," Russell-road, Rhyl, within 14 days from the date of publication of this advertisement.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER in Pathology required in this large general hospital containing well-equipped laboratory where excellent opportunities exist for gaining extensive experience.

Applications should be sent immediately to Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) ORTHOPÆDIC HOUSE SURGEON (resident) required in the Orthopædic and Accident Unit. The service consists of 100 beds equally divided between traumatic surgery and "cold" orthopædics. Post is recognised for pre-registration purposes and for F.R.C.S.

Applications to be sent to Group Secretary, Romford Hospital Management Committee, Oldchurch Hospital, as early as possible.

AMENDED ADVERTISEMENT

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. Orthopædics. BRIDGE OF EARN HOSPITAL, PERTHSHIRE. (806 Beds.) Applications are invited for a post as REGISTRAR in Orthopædic Surgery at the above Hospital (280 fracture and orthopædic beds). Previous experience in orthopædics essential.

Further particulars and forms of application from the Secretary to the Board, "Braeknowe," 430, Blackness-road, Dundee, with whom applications should be lodged not later than 26th February, 1955.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. General Medicine. MARYFIELD HOSPITAL, DUNDEE. Applications are invited for a temporary appointment for 1 year from 1st April, 1955, as SENIOR REGISTRAR (or REGISTRAR) in the Unit of the Professor of Medicine at the above Hospital, a general teaching hospital of 400 beds associated with the University of St. Andrews. Salary and conditions of service in accordance with national agreement.

Forms of application and further particulars from the Secretary to the Board, 430, Blackness-road, Dundee, with whom applications must be lodged not later than 26th February, 1955.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a REGISTRAR or SENIOR REGISTRAR in Medicine in a teaching unit in Edinburgh. The appointment is subject to the terms and conditions of the National Health Service.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 3 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, by 5th March, 1955.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of Locum RESIDENT HOUSE SURGEON. Post vacant from now until 30th June.

Apply, naming 2 referees, to Group Secretary, Odstock Hospital, Salisbury.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR to the Obstetric and Gynæcological Department at above Hospital vacant 12th May. The Unit comprises 40 obstetric beds and 35 gynæcological beds and is recognised for the Diploma and Membership of the Royal College.

Application forms may be obtained from, and must be returned to, the Group Secretary, Odstock Hospital, Salisbury, by 26th February.

SCUNTHORPE AND DISTRICT WAR MEMORIAL HOSPITAL, SCUNTHORPE, LINCS. (267 Beds.) SCUNTHORPE HOSPITAL MANAGEMENT COMMITTEE. Vacancy end of March for HOUSE PHYSICIAN (resident). Post graded Senior House Officer but also recognised for pre-registration purposes. Busy department, offering variety of experience.

Applications from suitably qualified registered practitioners and pre-registration candidates, naming 2 referees, to Group Secretary.

SHEFFIELD. CITY GENERAL HOSPITAL. Applications are invited for the resident appointment of HOUSE SURGEON (general surgery), recognised pre-registration post. Vacant immediately.

Applications, giving full details of age, nationality, qualifications present and previous appointments if any, and the names of 2 persons to whom reference may be made, should be forwarded to W. STANSFIELD at Nether Edge Hospital, Sheffield, 11.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications are invited for the following non-resident posts of :—

SENIOR REGISTRAR in Radiology at the Royal Infirmary/Royal Hospital Units. Post vacant. Candidates should hold a Diploma in Diagnostic Radiology. The appointment is for 1 year in the first instance and will be reviewed annually. It has been agreed in principle between the Board of Governors of The United Sheffield Hospitals and the Sheffield Regional Hospital Board that the appointment, if extended to the full period of 4 years, will be divided, subject to satisfactory work and progress, between The United Sheffield Hospitals and a hospital in the Region.

Closing date for applications 19th February, 1955.

ORTHOPÆDIC REGISTRAR to the Royal Hospital Unit. Post vacant 25th March.

Applications should be sent immediately.

Applications for the above posts should state age, qualifications, and experience, with the names of 3 referees, and be sent to The Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

SOUTHAMPTON CHILDREN'S HOSPITAL. (Recognised by Conjoint Board for D.C.H.) HOUSE OFFICER required from mid-March. Salary, &c., as nationally advocated.

Applications, with copies of testimonials, should be submitted immediately to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHEND-ON-SEA GENERAL HOSPITAL. Applications are invited for the post of RESIDENT ANÆSTHETIST vacant on 1st April, 1955. Senior House Officer grade, salary £745 p.a., less £140 p.a. for full residential emoluments. Appointment for 18 months, involving duties for 6 months at the General Hospital, Southend, followed by 6 months at the General Hospital, Rochford, and 6 months at hospitals in the Group generally. This combined appointment has been recognised as fulfilling the conditions of the F.F.A.R.C.S. and the D.A.

Applications, &c., should reach the undersigned at the Hospital by 17th February, 1955. J. C. FIELD, Secretary.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Chest Diseases to fill a vacancy in the approved trainee establishment at the Sidcup and Swanley Group of hospitals for duty mainly at Kettlewell Hospital, Swanley, Kent. Candidates must have had good experience in general medicine and in the diagnosis and treatment of pulmonary tuberculosis in adults. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications, and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 26th February, 1955.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Chest Diseases to fill a vacancy in the approved trainee establishment at the Brighton and Lewes Group of hospitals, for duty mainly at Bevendean Hospital, Bear-road, Brighton, 1, which is a unit of approximately 150 Beds devoted to the active treatment of tuberculosis, and also at chest clinics in the area. Candidates must have had good experience in general medicine and in the diagnosis and treatment of pulmonary tuberculosis in adults. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications, and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 26th February, 1955.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time SENIOR REGISTRAR in Psychiatry to fill a vacancy in the approved trainee establishment at Bexley Hospital, Dartford Heath, Bexley, Kent. Candidates should possess the D.P.M. and have had wide experience in general medicine. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance. The post will include opportunities for gaining further experience in a wide range of psychiatry including attendance at adult outpatient clinics.

Applications, giving particulars of age, qualifications, and experience with relevant dates, together with the names and addresses of 3 referees, should be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 26th February, 1955.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Psychiatry to fill a vacancy in the approved trainee establishment in the Darenth and Stone Group of hospitals for duty at Darenth Park, Dartford (for the training of mental defectives). Previous experience in general medicine is desirable. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications, and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 26th February, 1955.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Anæsthetics to fill a vacancy in the approved trainee establishment at the Dartford, Kent, Group of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications, and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 26th February, 1955.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. WINDSOR GROUP HOSPITAL MANAGEMENT COMMITTEE. Locum RESIDENT ANÆSTHETIC REGISTRAR required 21st February–2nd March inclusive.

Applications, stating age and qualifications with 2 testimonials, to Hospital Secretary.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. WINDSOR GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (casualty) required, 1 of 2, for busy Casualty Department. Experience provided in orthopædic and plastic cases.

Applications, stating age and qualifications, together with copies of 2 testimonials, to Hospital Secretary.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. WINDSOR GROUP HOSPITAL MANAGEMENT COMMITTEE. Locum HOUSE OFFICER (casualty) required immediately.

Applications, stating age and qualifications, together with 2 testimonials, to Hospital Secretary.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. Locum SENIOR HOUSE OFFICER (casualty) required.

Applications, with 2 testimonials, to Hospital Secretary.

SWANSEA HOSPITAL. (407 Beds.) Glantawe Hospital MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the appointment of SENIOR HOUSE OFFICER in the Surgical Unit of the above Hospital. The Hospital is recognised for the F.R.C.S. (Eng.) examinations.

Applications, stating age, qualifications and experience, should be forwarded to the Group Secretary, Glantawe Hospital Management Committee, St. Helen's-road, Swansea.

SWANSEA HOSPITAL. (407 Beds.) Glantawe Hospital MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the appointment of SENIOR HOUSE OFFICER in the Traumatic and Orthopædic Department of the above Hospital. The post is recognised under the F.R.C.S. regulations.

Applications, stating age, qualifications and experience, should be addressed to the Group Secretary, Glantawe Hospital Management Committee, St. Helen's-road, Swansea.

STAFFORD HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics), Male or Female. Recognised for D.A. Duties mainly at General Infirmary, Stafford (175 Beds), which is the main and acute general hospital of the Group.

Applications, with copies of 3 testimonials, to the Group Secretary, Stafford Hospital Management Committee, 13, Foregate-street, Stafford.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE OFFICER (medical), pre-registration post, vacant 5th March. Includes dermatology.

Apply Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

ST. ALBANS (near), HERTFORDSHIRE. SHENLEY HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER (Psychiatrist), resident or non-resident, for 1 year in the first instance, at Shenley Hospital, 16 miles from London. Opportunity for work with neurotic as well as psychotic patients, and full facilities for D.P.M. training. The Hospital may be visited by appointment.

Applications to the Medical Superintendent.

ST. HELENS AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. WHISTON HOSPITAL, PRESCOT. (892 Beds.) Applications are invited for the appointment of SENIOR HOUSE OFFICER (resident), Obstetrics and Gynæcology. Salary in accordance with the terms and conditions of service for medical staff. The position is recognised for the M.R.C.O.G. and D.Obst.R.C.O.G. examination.

Applications, stating age, qualifications and experience, and giving 2 names for reference, should be forwarded to—

N. RICHARDS, Secretary.

Group Office, Whiston Hospital, Prescot.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE SURGEON for the Unit of Obstetrics and Gynæcology. Post recognised for M.R.C.O.G. Preference given to candidates seeking pre-registration House Officer post.

Applications, stating age, experience, and qualifications with copies of 2 testimonials, to Hospital Secretary.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. Applications invited for post of SENIOR HOUSE OFFICER to Special Unit for Juvenile Rheumatism. Scope for those interested in research, paediatrics, rheumatology or cardiology, and previous experience in 1 of these desirable. Post becomes vacant 22nd March and tenable for 6 months in first instance.

Applications, stating age, qualifications, and experience with dates, with copies of 3 testimonials, to Hospital Secretary.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. Applications invited for post of HOUSE PHYSICIAN to the Special Unit for Research in Juvenile Rheumatism vacant 3rd April. Post offers scope for those interested in research, pædiatrics, rheumatology or cardiology.

Applications, stating age, qualifications and experience with dates, together with copies of 2 testimonials, to Hospital Secretary.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. Applications invited for post of SENIOR HOUSE OFFICER to Department of Pathology. Scope for participation in routine work of all sections of department and in research undertaken by Special Unit for Juvenile Rheumatism. Post vacant 18th March, resident, and tenable for 1 year.

Applications, giving age, full details of qualifications and experience, together with copies of 3 recent testimonials, to Hospital Secretary.

VENTNOR, ISLE OF WIGHT. ROYAL NATIONAL HOSPITAL FOR DISEASES OF THE CHEST. (249 Beds.) Required, SENIOR or JUNIOR HOUSE OFFICER (resident post), vacant 24th March. Hospital has all facilities for major thoracic surgery.

Applications, with names of 2 referees, to Physician-Superintendent.

WARRINGTON INFIRMARY. (172 Beds.) Applications are invited for the post of RESIDENT CASUALTY OFFICER (Male or Female). The post is graded Junior Hospital Medical Officer. Scale of salary £775–£50–£1075, less a deduction of £130 for residential emoluments. Applications will also be considered from Junior Medical Officers who would be graded House Officer or Senior House Officer at the scale appropriate to the experience of the applicant. Consideration will also be given to applicants who desire the appointment on a short-term basis. A whole-time Senior Hospital Medical Officer is in charge of the Department.

Applications, stating age, experience, and qualifications, should be forwarded or telephoned to—

H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancs.
(Tel. No. Warrington 1666).

WARRINGTON INFIRMARY. (172 Beds.) Applications are invited for a vacancy at the above Hospital for a RESIDENT HOUSE SURGEON (Male or Female). Recognised for pre-registration. Salary will be £425–£525 p.a., less a deduction of £125 for full residential emoluments.

Applications should be sent to—

H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancs.

WARWICK (near). KING EDWARD VII MEMORIAL CHEST HOSPITAL. (225 Beds.) SENIOR HOUSE OFFICER (resident desirable). Hospital is modern one with Thoracic Surgical Unit.

Applications to Medical Superintendent.

WATFORD MATERNITY HOSPITAL, King-street, WATFORD. (58 Beds.) Applications are invited for the resident post of JUNIOR OBSTETRICS OFFICER for duties commencing 1st April, 1955. Salary £425–£525 p.a. according to experience, less £125 p.a. for residential emoluments. Hospital recognised for M.R.C.O.G. examination.

Applications, giving full details of age, nationality, qualifications, present and previous appointments with dates, and copies of 3 testimonials, should be sent to the Hospital Secretary not later than 26th February.

WELSH REGIONAL HOSPITAL BOARD.

REGISTRAR (psychiatry), Morgannwg Hospital, Bridgend (all modern treatments, active outpatient clinics, Child Guidance Clinic and Psychological Department). Accommodation available.

SURGICAL REGISTRAR (orthopædics) to serve Cardiff Hospital Management Committee. Based at Prince of Wales Hospital, Rhydlafar, near Cardiff (200–300 Beds). Hospital is Regional Orthopædic Centre for South Wales area. Married accommodation available.

Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WEST BROMWICH AND DISTRICT GENERAL HOSPITAL. (144 Beds.) HOUSE SURGEON (pre-registration), vacant 1st April, 1955.

Applications, with 3 recent testimonials, to Group Secretary, West Bromwich and District Hospital Management Committee, Edward-street, West Bromwich.

WEYMOUTH AND DISTRICT HOSPITAL. (124 Beds.) HOUSE SURGEON required (Male or Female). Post vacant mid-February and tenable for 6 months. Recognised for F.R.C.S. examination and approved for Pre-registration Service.

Applications, stating age, experience, qualifications and nationality, together with copy testimonials, to Group Secretary, West Dorset Hospital Management Committee, Damers-road, Dorchester, Dorset, immediately.

WINDSOR. KING EDWARD VII HOSPITAL. Applications invited from General Practitioners for 2 posts of HONORARY CLINICAL ASSISTANT, each of 1 session per week—1 in general surgery on Friday afternoons vacant 18th March, and 1 in general medicine on Friday mornings vacant 29th April. Applicants required to be members of Medical Protection Society.

Applications, stating age, qualifications with dates, and nationality, with copies of recent testimonials or names of 2 referees, to Hospital Secretary by 28th February.

WOLVERHAMPTON GROUP.

New Cross Hospital, Wolverhampton

HOUSE OFFICER (general surgery). Pre-registration post. Vacant 28th February.

Apply Secretary, The Royal Hospital, Wolverhampton.

WORCESTER. RONKSWOOD HOSPITAL. Resident ANÆSTHETIST (Senior House Officer status) required for post which is recognised by the Faculty of Anæsthetists. Duties cover all specialties. Married accommodation available.

Applications, with names and addresses of 3 referees, to be sent to the Hospital Secretary.

WREXHAM. MAELOR GENERAL HOSPITAL. (591 Beds.) Applications are invited for the post of PÆDIATRIC HOUSE PHYSICIAN at the above Hospital. The post is a pre-registration one and is recognised for the D.C.H.

Applications, stating age with details of previous experience and names of 2 referees, should be sent to the Group Secretary, Maelor General Hospital, Wrexham, as soon as possible.

WREXHAM. MAELOR GENERAL HOSPITAL. (591 Beds.) Applications are invited for the post of HOUSE SURGEON at the above Hospital. The appointment is recognised for the Diploma of F.R.C.S. (Eng. and Edin.) and is a pre-registration post.

Applications, stating age, nationality, qualifications, and experience, together with copies of 2 recent testimonials, should be addressed to the Group Secretary Maelor General Hospital, Wrexham, as soon as possible.

WREXHAM. WAR MEMORIAL HOSPITAL. (230 Beds.) Applications are invited for the post of HOUSE SURGEON at the above Hospital. The appointment is recognised for the Diploma of F.R.C.S. (Eng. and Edin.) and is a pre-registration post.

Applications, stating age, nationality, qualifications, and experience, together with copies of 2 recent testimonials, should be addressed to the Group Secretary, Maelor General Hospital, Wrexham, as soon as possible.

YORKSHIRE. EAST RIDING HOSPITAL MANAGEMENT COMMITTEE.

Westwood Hospital, Beverley, Yorkshire (229 Beds)

HOUSE OFFICER in Obstetrics and Gynæcology. Senior House Officer or House Officer grade according to experience. Hospital has Maternity Unit of 22 Beds and Gynæcological Annexe of 18 Beds.

Applications to Group Secretary.

YORK. CITY HOSPITAL. (Acute Hospital of 265 Beds with full Consultant Staff.) CASUALTY OFFICER (with charge of orthopædic beds). Junior Hospital Medical Officer grade. Resident or non-resident. Salary £775–£50–£1075 p.a. Recognised for F.R.C.S.

Applications, giving age, nationality, qualifications, experience with dates, and names of 2 referees, immediately to the Secretary, York A and Tadcaster Hospital Management Committee, Bootham Park, York.

IBADAN, NIGERIA. UNIVERSITY COLLEGE HOSPITAL. The Board of Management invites applications for the undermentioned appointments :—

(*a*) SENIOR REGISTRAR (clinical pathology).
(*b*) REGISTRAR (clinical pathology).

Applicants for post (*a*) should preferably hold either the M.D. (Pathology) or a higher medical qualification. The Departments of Bacteriology and Morbid Anatomy are professorial units. There are at present Departments of Bacteriology, Chemical Pathology and Morbid Anatomy. Successful candidates will be given an opportunity of working in all 3 departments in rotation.

Salaries : Post (*a*) £1308 p.a. plus expatriation pay, where applicable, of £300 p.a. ; Post (*b*) £1020 p.a., plus expatriation pay, where applicable, of £240 p.a. A gratuity at the rate of £37 10s. for each completed period of 3 months service is payable on satisfactory completion of contract. Contracts will be for 1 tour of 12 months in the first instance. Outfit allowance of £60 is payable on first appointment. Liberal leave with free first-class passages for expatriate Officer and his wife will be granted on full pay on completion of tour. Officers are eligible for children's allowances. Partly furnished quarters are provided at a rental of 10% of salary, excluding expatriation pay.

Applications should be submitted not later than 21st February, 1955, on the appropriate form, which can be obtained, with further particulars, on receipt of an addressed foolscap envelope, from the Adviser on Staff Recruitment, University College Hospital, Ibadan, 57, Catherine-place, London, S.W.1.

BRITISH COLUMBIA. CHILDREN'S HOSPITAL, 250, West 59th-avenue, VANCOUVER 15, BRITISH COLUMBIA, CANADA. 2 PÆDIATRIC RESIDENTS required for a period of 1 year, commencing 1st July, 1955, for 83-Bed Children's general hospital. University teaching programme. Accommodation available. Remuneration $175 per month, less $15 per month accommodation. Meals available if required.

Applications, stating age, qualifications, nationality, accompanied by recent references and photograph, should be forwarded by air-mail to the Administrator.

U.S.A. RICHMOND, VIRGINIA. HOSPITAL DIVISION, MEDICAL COLLEGE OF VIRGINIA. Positions open for ASSISTANT RESIDENT and JUNIOR ASSISTANT RESIDENT training beginning 1st July, 1955. 3-year training programme approved by the American Medical Association and the American Board of Psychiatry and Neurology.

Send applications to Doctor R. FINLEY GAYLE, Jr., Professor of Psychiatry, Medical College of Virginia, Richmond 19, Virginia, for details concerning formal training programme and salary.

Public Appointments

BAHAMAS GOVERNMENT. District Medical Officer required for service in the Bahamas. Successful candidate will be posted to a specified area, e.g., Bimini, Abaco, Andros and Harbour Islands. Duties are similar to those of a general practitioner in the United Kingdom. Appointment will be on agreement for 3 years in the first instance. Salary scale is from £1000 to £1100 a year; but maximum may be paid to suitably qualified Officer. Private practice is permitted. There is, at present, no income-tax. Unfurnished quarters are available. Passages provided for Officer, wife and up to 2 children on appointment, and on completion of period of engagement. Assistance up to £40 is given towards cost of transporting heavy baggage. Climate is excellent and healthy for Europeans. Social and recreational amenities are good. 12 weeks leave on full salary is granted on completion of engagement. Candidates should hold qualifications registrable in the United Kingdom.

Application forms from Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. BCD.117/27/03).

BAHAMAS GOVERNMENT. Pathologist required at the Bahamas General Hospital. Appointment will be on agreement for 3 years. Salary is in scale £1150–£50–£1300 a year, starting salary depending upon qualifications and experience. Fees for pathological work undertaken on behalf of private practitioners may be retained. Quarters are not provided, but assistance towards rent of a furnished house will be given. Cabin-class passages will be provided for Officer, wife and up to 2 children on appointment and on completion of agreement. Assistance up to £40 is given towards cost of transporting heavy baggage. No income-tax. Generous leave on completion of agreement. Climate is excellent and healthy for Europeans. Social and recreational amenities are good. Candidates should hold qualifications registrable in the United Kingdom and should have had experience in pathology.

Application forms from Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. BCD.117/27/04).

FACTORY DOCTORS. Factories Acts, 1937 and 1948. The following appointments as Appointed Factory Doctor are vacant. Apply to Chief Inspector of Factories, 19, St. James's-square, London, S.W.1.

District	*County*	*Latest date for receipt of applications*
TATTENHALL ..	CHESTER ..	26TH FEBRUARY, 1955
BURNLEY SOUTH ..	LANCASTER ..	26TH FEBRUARY, 1955
BATLEY ..	YORK ..	26TH FEBRUARY, 1955

NOTTINGHAM. CITY OF NOTTINGHAM. Health SERVICES. MEDICAL LOCUM-TENENS—Summer Period 1955. Applications are invited from medical practitioners with experience of maternal and child health for a Locum-tenens appointment from May to the end of September, 1955. Salary will be at the rate of £950 p.a.

Applications, accompanied by the names of 2 persons to whom reference may be made, should be sent to the Medical Officer of Health, Huntingdon-street, Nottingham, not later than 1st March, 1955. T. J. OWEN, Town Clerk.

Guildhall, Nottingham, January, 1955.

NOTTINGHAMSHIRE COUNTY COUNCIL. West BRIDGFORD URBAN DISTRICT COUNCIL; BINGHAM RURAL DISTRICT COUNCIL. Applications are invited from registered medical practitioners for the mixed whole-time appointment of ASSISTANT COUNTY MEDICAL OFFICER AND MEDICAL OFFICER OF HEALTH of the West Bridgford Urban District and Bingham Rural District. Applicants must have had at least 3 years professional experience since qualifying; be experienced in the duties of Medical Officer of Health, School Medical Officer, and the care of mothers and young children and possess a Diploma in Public Health.

Salaries are in accordance with Awards 2285, 2231 and 2452 of the Industrial Court for Public Health Medical Officers holding mixed appointments, namely:—

(a) As Assistant County Medical Officer (16/44ths) £500 p.a.–£22 14s. 6d.–£590 18s. 0d. (on scale £1100–£50–£1300 plus loading in accordance with Spens Formula).

(b) As Medical Officer of Health, West Bridgford Urban District (12/44ths) £422 14s. 6d.–£13 12s. 9d.–£477 5s. 6d. (on scale £1450–£50–£1650 plus 12/44ths of £100).

(c) As Medical Officer of Health, Bingham Rural District (16/44ths) £563 12s. 9d.–£18 3s. 8d.–£636 7s. 5d. p.a. (on scale £1450–£50–£1650 plus 16/44ths of £100).

Application forms and conditions of appointment are obtainable from my office, and applications should reach me by 4th March, 1955. Canvassing disqualifies.

A. R. DAVIS, Clerk of the County Council.

Shire Hall, Nottingham.

BIRMINGHAM. CITY OF BIRMINGHAM EDUCATION COMMITTEE. Applications are invited from registered medical practitioners (Men or Women) for appointment as SCHOOL MEDICAL OFFICER in the School Health Service. The possession of a D.P.H. or D.C.H. will be an advantage. Salary in accordance with Whitley Council scale of £950–£50–£1300 p.a. Appointment is subject to the appropriate superannuation act and to the passing of a medical examination.

Forms of application obtainable from the undersigned (stamped addressed envelope) must be returned not later than 28th February, 1955. Canvassing disqualifies.

E. L. RUSSELL, Chief Education Officer.

Queen's College Chambers, 38a, Paradise-street, Birmingham, 1.

BUCKINGHAMSHIRE. COUNTY OF BUCKS. Applications are invited from registered medical practitioners holding the qualifications prescribed by the Sanitary Officers (Outside London) Regulations, 1935 and 1951, for the whole-time joint appointment of ASSISTANT COUNTY MEDICAL OFFICER AND DEPUTY MEDICAL OFFICER OF HEALTH for the Borough of Buckingham, the Bletchley, Linslade and Newport Pagnell Urban Districts, and the Buckingham, Newport Pagnell and Wing Rural Districts. Salary within the scale of £996–£1334 p.a. Travelling and subsistence allowances will be paid on the appropriate Council's scale. The appointment is superannuable.

Further particulars and forms of application may be obtained from the undersigned, to whom applications must be delivered by 25th February, 1955.

GUY R. CROUCH, Clerk of the Bucks County Council.

County Hall, Aylesbury, January, 1955.

HER MAJESTY'S OVERSEA CIVIL SERVICE. Medical BRANCH—KENYA. Vacancies exist for MEDICAL OFFICERS for general duties in the Medical Department of Kenya. A vacancy also exists for a MEDICAL OFFICER interested in Parasitology. Successful candidates may be posted to any station in Kenya. During the earlier years of service an Officer will be expected to carry out general medical and surgical duties including a varying amount of public health administration. In most stations, even if remote from the larger towns, it is possible for an Officer to maintain interest in any particular branch of medicine or surgery to which he is attracted. As far as possible the interests of an Officer are considered when postings are made. The work of every Medical Officer is based on a hospital which may vary in size and facilities from a small district hospital meeting the needs of a comparatively primitive community to a large and modern provincial hospital. Appointments can be made on a permanent basis with pension (non-contributory) at age of 55, or on short-term contract with gratuity payable on satisfactory completion of service. Salary varies from £1116 to £1836 a year; starting-point is determined by experience and 4 extra increments are given to successful candidates possessing the M.R.C.P., D.P.H., or other approved higher qualifications. Temporary cost-of-living allowance at the rate of 10% of salary is also payable, subject to a maximum of £162 a year making gross emoluments of £1228–£1998 a year. Permanent Medical Officers are eligible to be considered at any time for promotion to super-scale posts in Kenya and other territories in medical administration or, if they possess higher qualifications and suitable experience, in specialist posts. Quarters are generally available at rental of 10% of salary. Free passages in both directions for Officer and wife and up to cost of 1 adult fare for children. Taxation at local rates. Annual local leave permissible and generous home leave granted after each tour of from 40 to 48 months. Educational facilities are available. Candidates must possess medical qualification registrable in the United Kingdom and at least 1 years post-graduate hospital experience.

Application forms from Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. BCD.117/7/02).

HER MAJESTY'S OVERSEA CIVIL SERVICE. Medical BRANCH—BARBADOS. MEDICAL OFFICER OF HEALTH required in Medical Department of Barbados. Duties include school health, public health education, maternal and child welfare clinics, tuberculosis, and venereal diseases clinics, control of quarantinable diseases and coöperation with Local Government bodies in their health matters with special relation to sanitation and hygiene. Candidates must possess qualifications registrable in the United Kingdom and a Diploma in Public Health. Experience in public health practice and a qualification in tropical medicine and hygiene are desirable but not essential. Appointment will be on a permanent basis with pension (non-contributory) at the age of 55 or on agreement for 3 years in the first instance (in which case passage regulations are slightly different). Salary scale is from $5280 to $6240 (£1100–£1300) p.a. Pension is earned at the rate of 1/600th of the final pensionable emoluments for each completed month of service. In addition a temporary (non-pensionable) cost-of-living allowance of $156 (£32 10s.) p.a. is payable. On appointment, free passages are provided for Officer and family up to a total cost of £300. Leave passages are provided for Officer and wife after the completion of a minimum tour of 3½ years. Income-tax at local rates. Climate is healthy for Europeans. Social and recreational amenities are good. Educational facilities are available.

Application forms from Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. BCD.117/28/012).

SHEFFIELD. CITY OF SHEFFIELD. Assistant Medical OFFICER for maternity and child welfare required in Public Health Department. Candidates should have experience or special qualifications in either child welfare or obstetrics. Post superannuable; medical examination. Salary scale £950–£50–£1300 p.a.

Applications, giving age, qualifications, experience, present and previous appointments with dates, names of 3 referees, and endorsed "Assistant Medical Officer (M.C.W.)" to be forwarded by 28th February, 1955, to JOHN HEYS, Town Clerk.

Town Hall, Sheffield, 1.

LUTON. BOROUGH OF LUTON. Applications are invited for the appointment of ASSISTANT MEDICAL OFFICER (Female). Salary within grade £950–£50–£1300 according to qualifications and experience. Car allowance. Preference will be given to applicants possessing a Diploma in Public Health. Duties will include work in connection with School Health Service, hospital treatment of infectious diseases, and Part III personal health services.

Full particulars and conditions of appointment obtainable from the undersigned. Closing date for applications 1st March, 1955.

Town Hall, Luton. A. D. HARVEY, Town Clerk.

PLYMOUTH. CITY OF PLYMOUTH. Applications are invited for the post of ASSISTANT MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER from registered medical practitioners, Male or Female, who have had at least 3 years' experience since qualification. The possession of the D.P.H. or D.C.H. is desirable. The post is superannuable and subject to medical examination and the salary scale is £950–£50–£1300 p.a. The appointment is terminable by 3 months notice on either side. The work will be primarily in the School Health and Maternity and Child Welfare Departments but other duties of a general public health nature may be allocated by the Medical Officer of Health.

Applications, stating qualifications and experience, together with the names and addresses of 2 referees should be sent to the undersigned in an envelope endorsed "Assistant Medical Officer of Health" not later than 7th March, 1955. Forms of application are not provided.

T. PEIRSON, Medical Officer of Health.

Seven Trees, Lipson-road, Plymouth.

SURREY COUNTY COUNCIL. Appointment of Assistant MEDICAL OFFICERS (Male). Applications are invited from Male doctors for these full-time appointments, 1 in Carshalton and the other in Guildford. Applicants must possess either the D.P.H. or D.C.H. The main duties will be in connection with the School Health and Maternity and Child Welfare Services. Salary according to experience on the grade £950–£50–£1300 p.a. The appointments are subject to satisfactory medical examination, to the provisions of the Local Government Superannuation Acts, 1937–1953, and to 3 months notice on either side.

Application forms from the County Medical Officer, County Hall, Kingston-on-Thames, to be returned by 26th February, 1955.

WARRINGTON. COUNTY BOROUGH OF WARRINGTON. HEALTH DEPARTMENT. Applications are invited from suitably qualified medical Women for the appointment of ASSISTANT MEDICAL OFFICER AND SCHOOL MEDICAL OFFICER. The salary is £950 p.a., rising by annual increments of £50 to a maximum of £1300 p.a. Experience in dealing with children is essential, but possession of the D.P.H. or D.C.H. would be an advantage. The duties will be mainly clinical in connection with Maternity and Child Welfare or School Medical Services, as may be required. A car allowance is payable. The post is superannuable and subject to a satisfactory medical examination.

Applications, giving full details of age, qualifications and experience, together with the names of 2 persons to whom reference can be made, should be forwarded to the undersigned forthwith. ERIC H. MOORE, Medical Officer of Health and Principal School Medical Officer.

Health Department, Sankey-street, Warrington, January, 1955.

General Practice

For an Executive Council post (England and Wales) apply on form **E.C.16A** *obtainable from the council. Mark envelope "Vacancy."*

CARLISLE, CUMBERLAND. Applications invited for VACANCY (chiefly urban). List at present approximately 2100. Intermediate area. Residence and surgery will be available. Apply on E.C.16A not later than first post 21st February, 1955, to S. PARKER, Esq., Clerk of the Carlisle Executive Council. 1, Brunswick-street, Carlisle.

GREAT BARDFIELD, ESSEX. Applications invited for death VACANCY (rural—restricted area). List at present approximately 2150. Residential and surgery accommodation will be available, by purchase. Apply on Form E.C.16A before 24th February, 1955, to E. BERGDAHL, Clerk of the Council. Essex Executive Council, 131/3, Fillebrook-road, Leytonstone, E.11.

ST. OSYTH, ESSEX. Applications invited for retirement VACANCY (rural—restricted area). List at present approximately 1100. Residential and surgery accommodation may be available. Apply on Form E.C.16A before 24th February, 1955, to E. BERGDAHL, Clerk of the Council. Essex Executive Council, 131/3, Fillebrook-road, Leytonstone, E.11.

WESTGATE-ON-SEA, KENT. Applications invited for VACANCY (urban) due to death. List at present approximately 2040. Residence and surgery available by purchase Apply on E.C.16A before 26th February, 1955, to— F. E. MILES, Clerk, Kent and Canterbury Executive Council. 11, Station-road, Maidstone.

Hospital Services : Non-Medical Appointments

BIRMINGHAM ACCIDENT HOSPITAL, Bath-row, BIRMINGHAM, 15. SENIOR TECHNICIAN or TECHNICIAN (according to qualifications and experience) in Histology Laboratory, Pathology Department. Considerable histological experience essential and general experience in hospital laboratory technique desirable. Whitley Council terms. Further particulars from Consultant Pathologist.

Applications, naming 2 professional referees or with 2 recent testimonials, to Administrator.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL, BIRMINGHAM, 16. Applications are invited from Men and Women for the appointment of BIOCHEMIST (Basic grade). Candidates should possess a B.Sc. Degree with honours in Biochemistry or Chemistry or equivalent qualification. Whitley Council salary and conditions of service.

Applications, with names of 2 referees, should be sent to the House Governor, as soon as possible.

CARLUKE, LANARKSHIRE. LAW HOSPITAL. Applications are invited from Science Graduates for the post of BIOCHEMIST (non-medical) at Law Hospital. The successful applicant will work under the direction of the Consultant Biochemist. Salary and conditions of service based on Whitley Council scales, either on the Basic grade or Senior grade according to experience and qualifications. Single accommodation available if desired.

Applications, stating age, qualifications, and experience, together with the names of 2 persons to whom reference can be made, to be addressed to the Group Secretary and Treasurer, Board of Management, Law Hospital, Carluke.

ST. ALBANS, HERTFORDSHIRE. HILL END HOSPITAL. BIOCHEMIST (non-medical, Senior grade). University Graduate, required for duties in the Pathological Department at the above Hospital situated within half-an-hours train journey of Central London. Duties consist of routine and more advanced biochemical techniques and research experience will be an advantage. Salary and conditions of service according to Whitley Council.

Applications to the Consultant Pathologist.

Miscellaneous

To non-professional posts the Notification of Vacancies Order 1952 applies.

Applications are invited from qualified practitioners in physical medicine, pædiatrics, and psychology, to serve on the medical selection panel to examine and interview applicants for schools and training centres operated by the National Spastics Society. The panel will hold its meetings in London and attendance fees will be paid on a sessional basis.—Applications should be addressed to the Secretary, Medical Advisory Committee, NATIONAL SPASTICS SOCIETY, 44, Stratford-road, London, W.8. Closing date 28th February.

Doctor, at present engaged part time preparing literature, &c., for small pharmaceutical company, seeks other similar part-time work or full-time appointment.—Address, No. 101, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

English/Spanish translator with 14 years experience in an Argentine College of Medicine, seeks scientific translations work.—85, Teddington Park-road, Teddington, Middlesex.

The London College of Pharmacy for Women continues to train and supply "Hall" Dispensers.—Apply Secretary, 7, Westbourne Park-road, W.2.

Consulting-rooms, full and part time, and Houses in the medical area.—ELGOOD & Co., 1, Bentinck-street, W.1 (WELbeck 8974).

Sussex. 11 miles Brighton. In centre of attractive village. Fine detached Georgian residence set in delightful grounds of approximately 4½ acres. At present used as Nursing-home for which it is very suitable or for Hotel, Old Folks Home, &c. 11 bedrooms, 2 reception rooms, billiards-room, sun lounge, 4 bathrooms, 6 W.C.s. Excellent domestic accommodation. Laundry. Outhouses. Glasshouses. Large garage. Constant hot water. Independent central heating plant. All main services. £15,000 freehold.—H. D. S. STILES & Co., 101, Western-road, Brighton (Telephone: Hove 35281); and 23, Berners-street, London, W.1 (Telephone: LANgham 7803).

Hove. Most suitable for professional occupation. A fine double-fronted detached property situated in Hove's premier thoroughfare recognised as a professional centre. Accommodation very suitable for suites of consulting-rooms or conversion to flats. Price £6500 freehold.—H. D. S. STILES & Co., 101, Western-road, Brighton (Telephone: Hove 35281); and 23, Berners-street, London, W.1 (Telephone: LANgham 7803).

Adrenolytic Investigation. Layman, who experimented on himself with baths containing hydrogen peroxide, and interpreted the results as anti-adrenergic (or possibly as antagonistic to "desoxy" corticoids), would be pleased if some research worker would care to determine, on a laboratory animal, the systemic effects of repeated moderate exposure to a "peroxide soak." Probably dangerous clinically until safe limits known (cf. Siebert, *Z. gez. exp. Med.* 1919, **9**, 123; *Chem. Abstr.* 1920, **14**, 426), and suspected cause of damage noticed afterwards in bath enamel. Advertiser feels that hydrogen peroxide baths must have been tried, especially in dermatology, and presumably abandoned as toxic or depressant, and that their basic pharmacology should be studied, in case some clinical use can be found.—G. C. WORTERS, BM/BIRCHES, London, W.C.1.

For Sale. Half skeleton, diagnostic set, and baumometer. —Apply, HY. DUKE & SON, Auctioneers, Dorchester, Dorset.

Laryngoscope, Macintosh pattern, hod blades, as new, real leather case. For sale £6, less than half cost.—PEARLMAN, Cornwallis-avenue, Folkestone.

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimen of urine and £1 1s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

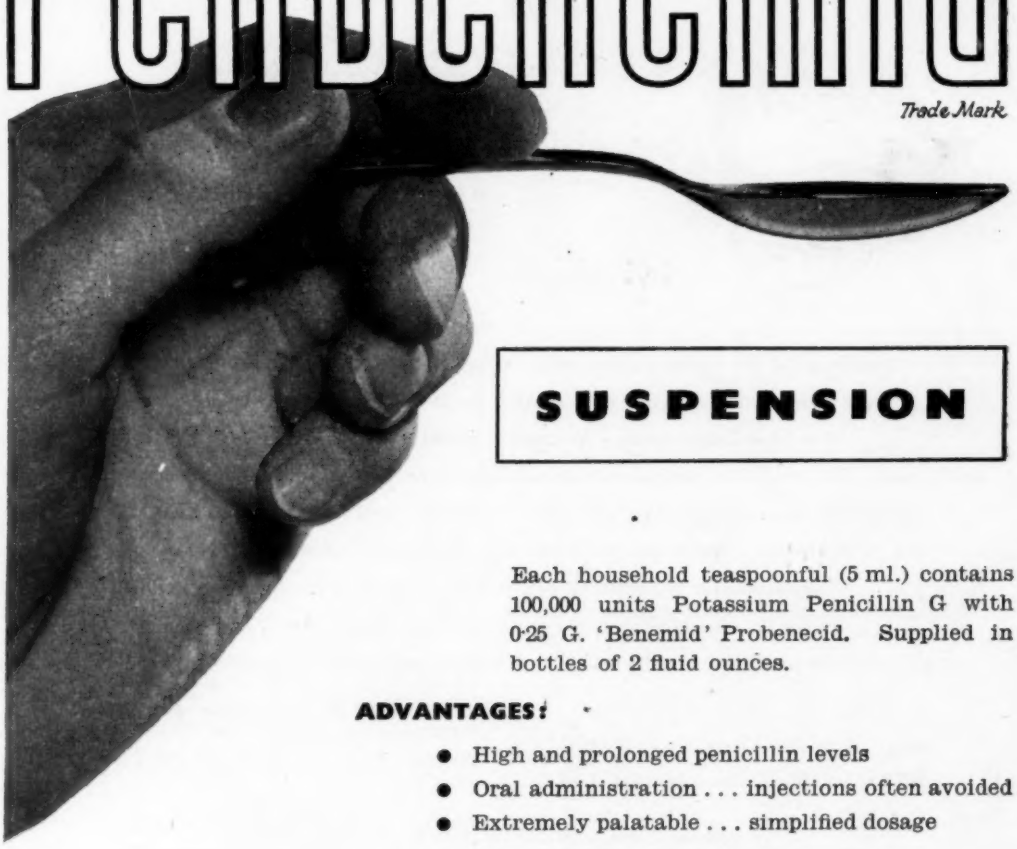
Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE, LTD., 98, Victoria-street, S.W.1 (Phone: VICtoria 0141), who are specialists in this kind of work.

PUBLISHED by the PROPRIETORS, THE LANCET LIMITED, 7, Adam Street, Adelphi, in the County of London.
Printed by HAZELL, WATSON & VINEY, LTD., London and Aylesbury—Saturday, February 12, 1955.
PRINTED IN GREAT BRITAIN—Entered as Second Class at the New York, U.S.A., Office.

NOW

Penbenemid

Trade Mark



SUSPENSION

Each household teaspoonful (5 ml.) contains 100,000 units Potassium Penicillin G with 0·25 G. 'Benemid' Probenecid. Supplied in bottles of 2 fluid ounces.

ADVANTAGES:

- High and prolonged penicillin levels
- Oral administration . . . injections often avoided
- Extremely palatable . . . simplified dosage

Descriptive literature gladly sent on request.

THE ENTIRELY NEW CONCEPT IN ORAL PENICILLIN THERAPY

Sharp & Dohme Ltd., Hoddesdon, Herts. SHARP & DOHME

AUREOMYCIN*
CHLORTETRACYCLINE
in paediatrics

Treatment of the young patient calls emphatically for *acceptable* medication if the child's confidence and co-operation are to be won. In this respect—as in so many senses—AUREOMYCIN is unsurpassed among antibiotics. It is available, for instance, in a delightful Syrup form . . . in highly concentrated Oral Drops . . . in Spersoids,* chocolate-flavoured dispersible powder . . . and in Soluble Tablets that mix unobtrusively with milk or other bland drinks. Indications for AUREOMYCIN include a great many of the infections of childhood. Moreover, the antibiotic is effective in small dosage and is of relatively low toxicity—factors of obvious advantage in paediatric practice.

CAPSULES 50 mg. : bottles of 25 and 100.

ORAL DROPS (100 mg. per cc.) : vials of 20 cc.

SOLUBLE TABLETS (50 mg.) : bottles of 100.

SPERSOIDS * Dispersible Powder : 50 mg. per 3 Gm. : Jars of 36 Gm. and 75 Gm.

SYRUP (125 mg per 4 cc.) : bottles of 4 and 16 fl. oz.

Available also in other orms : DENTAL CONES · DENTAL PASTE
INTRAVENOUS† · NASAL · OINTMENT · OPHTHALMIC · OPHTHALMIC OINTMENT
OTIC · TROCHES · VAGINAL POWDER

* *Trade-Mark.* † *Available only to Hospitals*

When it's a case of infection . . . look first to Aureomycin

Lederle

LEDERLE LABORATORIES DIVISION *Cyanamid Products Ltd.* **BUSH HOUSE · ALDWYCH · LONDON, W.C.2 · TEMPLE BAR 5411**